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NUMBER 11

CORRELATES OF AMBIVALENCE,
RISK-TAKING AND RIGIDITY

DR. A. MINKOWICH

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THE HEBREW UNIVERSITY
DEPARTMENT OF PSYCHOLOGY
JERUSALEM, ISRAEL

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ABSTRACT

The present stage of our research consisted of three parts: (1) a replication study, (2) a study of perceptual styles and sensitivities and (3) a study on the impact of induced guilt on ambivalence and hostility.

A. The replication study. The previous study on the correlates of ambivalence, risk taking and rigidity was repeated with two samples of college students, 35 males and 39 females in order to test the replicability of findings and to examine sex differences by a more detailed analysis.

1. Battery of tests. The battery of tests from the previous study was employed in the present study with certain modifications and additions. It contained the following classes of variables:

a. Personality traits. Both samples were tested for ambivalence and hostility toward self and others by a semi-projective technique and for anxiety by the Taylor MAS. Females were also administered the Marlow-Crowne SD to assess social desirability and defensiveness.

b. Cognitive and perceptual styles. Both males and females were given the Rokeach Dogmatism Scale and a verbal fluency test. The males were assessed on field dependence by the Witkin EFT and on intolerance of ambiguity by the Smock Ambiguity Task. The females were administered the Frenkel-Brunswick Cat-Dog Test for the measurement of perceptual rigidity and intolerance of ambiguity.

c. Socialization. A biographical questionnaire served to assess the type of parental discipline and the amounts of reward and punishment administered by parents during childhood.

d. Risk taking. Modified forms of the previously used tests of financial and physical risk and risk of prestige were given to both samples. The purpose of the modifications was to increase similarity between procedures and to achieve a greater resemblance of the tests to real-life situations.

2. Results

a. Ambivalence. Results indicated again the efficiency of our technique for assessing ambivalence and hostility. Verbal fluency and social desirability were found to have a very small influence on the responses of subjects in this test.

No significant differences between sexes regarding the intensity of ambivalence or hostility were found in the present study. (intensity of ambivalence was represented by mean scores). Ambivalence and hostility appeared again as generalized traits and were correlated with anxiety and punitive parental socialization. The negative relationship between ambivalence and risk of prestige was repeated for both sexes. For financial risk sex differences were found: ambivalent males tended to take higher financial risks than non-ambivalent males; for females this trend was reversed. The previously obtained relationship between ambivalence and physical risk was not repeated in the present study, perhaps because of the greater sophistication of subjects in psychological testing.

Males demonstrated the expected positive relationship between ambivalence and the perceptual styles of field dependence and intolerance of ambiguity. However, the female sample did not show the hypothesized relationships between ambivalence and perceptual rigidity or intolerance of ambiguity.

b. Risk taking. Males indicated a consistently greater (although not significant) tendency to take higher risks on all tests. Both sexes showed only a small degree of generality in risk taking behavior. This trait was again negatively correlated with anxiety and field dependence but not with dogmatism. The distinction between risk based on abilities and risk based on chance, which was demonstrated in the previous study, was less clear in the present study.

c. Anxiety. The positive relationships of manifest anxiety with ambivalence, hostility, field dependence and intolerance of ambiguity and its negative relationships with risk taking were repeated in the present study. Females obtained significantly higher anxiety scores than males.

B. The study of perceptual styles. A binocular rivalry test was given to 18 males and 29 females to measure three aspects in perception: (1) formal perceptual styles, (2) their variation in various content areas and (3) differential sensitivity in these content areas.

1. Procedures. A series of pictorial and verbal pairs of incompatible stimuli representing conflict areas of masculinity-femininity, aggression-affection, punitive socialization - indulgent socialization and activity - passivity. The perceptual styles of alternations between stimuli, simultaneous perception of both stimuli, distorted fusion of the stimuli and perceptual dominance of single stimuli were examined for their relationships with perceptual content sensitivities and with ambivalence.

2. Results. Both sexes showed a marked generality of perceptual styles. They were also similar in demonstrating a negative relationship between ambivalence and the style of simultaneous perception of stimuli in binocular resolutions. In all remaining relationships considerable sex differences were found. Perceptual alternations in the male sample were positively correlated with ambivalence, hostility and with perceptual sensitivity for items of masculinity and aggression. All these relationships were reversed for females. The correlations between alternations and the greater sensitivity for activity than for passivity items were negative for males and positive for females.

Ambivalence of males was correlated negatively with perceptual dominance for single items in the pairs and with sensitivity for activity items, while a positive relationship was found with sensitivity to masculinity items. Again, these relationships for the females were in the opposite direction.

Special consideration was given to the findings on the style of alternations. The positive relationship between ambivalence of males and perceptual alternations in the binocular resolutions were interpreted as a generalized tendency of response variability. Such a tendency was also demonstrated by the females in the positive correlation between ambivalence and vacillations on the Cat-Dog Test. Their negative correlations between these variables and alternations in the binocular resolutions may be explained by assuming that ambivalent females are more anxiety prone and tend to employ repression more readily in conflicts without awareness.

C. The influence of induced guilt on ambivalence. A sample of 29 males was given a modified form of the ambivalence test under standard conditions, and a week later, after an experimental manipulation designed to arouse guilt feelings. As predicted, ambivalence scores showed a significant decrease. But the hypothesized decrement of hostility toward others and a corresponding increment of hostility toward self was only partially substantiated. A similar study with a control group is needed to determine whether the decrease in ambivalence was due to the experimental manipulation or to test adaptation.

I. OBJECTIVES AND PROBLEMS OF THE PRESENT STUDY

The first stage of our research project focussed on problems of assessing ambivalence and risk taking tendencies and on exploring their interrelations within a theoretical framework of decision making behavior. Also, an attempt was made to interpret within this framework the demonstrated relationships between ambivalence and risk taking tendencies and the following variables: perceptual rigidity, intolerance of ambiguity, field dependence, dogmatism, anxiety and socialization experiences during childhood (10).

The objectives of this stage of our project were fourfold:

- (1) to replicate several aspects of the previous study with the introduction of some modifications in our techniques for measuring risk taking behavior;
- (2) to make more careful comparisons between sexes concerning our major variables;
- (3) to study intensively perceptual behavior in binocular rivalry situations which in many respects resemble situations arousing ambivalence and conflicting tendencies of decision making in general;
- (4) to investigate the impact of situationally-induced emotions of guilt or anger on ambivalence and hostility toward self and authority figures.

II. THE REPLICATION STUDIES

A. Outline of Problems

Our previous findings for college students, military and kibbutz samples regarding the relationships between ambivalence, risk taking, socialization and some personality traits were fairly consistent. We decided, nevertheless, to repeat the study with two more samples for the following reasons:

1. Each of our 3 previous samples consisted of an approximately equal number of males and females. Although a statistical analysis did not reveal significant mean differences between sexes in the great majority of our variables, there still existed the possibility of differences in the patterns of relationships between variables. A separate analysis for males and females within each sample was not carried out, however, because of the small size of each subsample. The considerable variation in the background of the three samples prevented us from pooling subjects of the same sex from our samples for such an analysis. The most defensible procedure was, then, to engage two new samples, one of males, the other of females, and to administer to them our battery of tests.
2. Our techniques for assessing risk taking behavior (physical, financial and prestige risk) raised several problems. The technique for physical risk - which measured the readiness to face the danger of a moderate electric shock - was not fully comparable to the techniques for assessing financial and prestige risks. The latter two techniques measured choice responses of subjects first without feedback and then with feedback, whereas the former measured choices without feedback only. The financial risk technique (as in most studies on risk taking) posed the question whether its nature did not make it too far removed from real life. Subjects wagered not on their own money but on a small sum of money which was promised but not given until the final payoff.

The prestige risk technique purporting to measure intelligent leadership was composed of 10 pairs of items, each pair consisting of an easy and a difficult item. Such a technique allowed for a much narrower range of variability as compared with the other two techniques.

All these considerations brought us to the introduction of considerable modifications in the three risk taking techniques.

B. Methods and Procedures

Two new college student samples were chosen for the study with the modified instruments. One consisted of 35 males with an age ranging from 19 to 25, another consisted of 39 females with an age ranging from 19 to 24 years. The subjects of both samples were psychology majors whose participation in our study was a part of the departmental requirements for undergraduates.

Each sample was tested in three sessions. In the first session subjects were given individually the first part of the ambivalence test, the financial risk test and a test of verbal fluency. In the second session, groups of 4 subjects were given the second part of the ambivalence test and the prestige risk test. The subjects of the female sample were also given the Marlow-Crowne Social Desirability Scale. For the third session each subject was called again individually and was exposed to the physical risk test and was given then a biographical questionnaire and the Taylor MAS. Males were given, in addition, the Smock Ambiguity Task and the Witkin Embedded Figure Test.

C. Description of Tests

The tests from our previous studies that were employed in the present study without modifications will be described only briefly. Those tests which were considerably modified, or have not been previously used, will be described in greater detail.

1 The Ambivalence Test

Subjects are asked to rate parents, parental surrogates and sibilins on a semi-controlled association task and on a semantic differential technique. Two scores were derived from this test for each figure: (1) an ambivalence score consisting mainly of indices of vacillations between positive and negative ratings; and (2) a hostility score in which neutral ratings were also included.

2. The Biographical Questionnaire

Most of the items in the questionnaire require subjects to describe the type of parental discipline and amounts of reward and punishment they had experienced during childhood.

3. Personality inventories

In addition to the Taylor Manifest Anxiety Scale (MAS) and the Rokeach Dogmatism Scale which have been employed in the first stage of our research, female subjects were also given the Marlow Crowne Desirability Scale (1). The authors demonstrated in a series of studies that a high score on the M-C.D.S. is an indication of a great need for social approval, sensitivity for self esteem, defensive tendencies and a high degree of social conformity.

4. Perceptual Tests

Parts from the Smock Ambiguity Task (12) which was employed in the previous study were administered to the male sample. The male sample was also given the Witkin Embedded Figure Test (13). The former test is a measure for intolerance of ambiguity, the latter for field dependence.

5. Risk Taking Tests

As we have already mentioned, considerable changes were introduced in all three types of risk taking tests.

a. Financial risk. As in the first stage of our project, the test consisted of 3 series of guesses and bets on cards randomly drawn from a pack of 48 playing cards. The first series constituted a guessing game with no money bets involved. Subjects were asked to write down 10 guesses about the nature of the cards in the order in which they would be drawn. However, instead of 3 alternative choices which were available in the previous studies, there were now six possibilities, with probabilities of occurrence ranging from .75 to .085. The same 10 guesses were required from the subjects in the second series, but this time each guess was accompanied by a money bet. In order to make it similar to a real betting situation, each subject was given 2 Israeli pounds and was asked to make 10 guesses, one at a time. A card was drawn after each guess and the payoff was executed on the spot. High probabilities were connected with smaller gains and losses than low probabilities, so that by choosing a certain probability the subject committed himself to a fixed bet size.

The third series consisted of 5 bets with the subjects' own money. A fixed probability of .25 was established for all 5 bets. However, this time, the subject had the freedom to choose the size of the bet within the range of 5 - 40 agoroth (1 agorah = 1/100 of a Israeli pound). As in the second series, each choice was followed by a draw and by an immediate execution of payoff.

Since the possible maximum loss in this series was 2 pounds, we gave additional money to those subjects whose gains were smaller than this, so that all subjects entered into the third series with an equal sum of money.

The following Figure represents the payoff matrix for the second series preceded by appropriate instructions.

It should be noted that the expected values were not equal for all alternatives but rather descended from $+.75$ for alternative A to -13.5 for alternative F. Studies concerned with mathematical models of decision making advocate, as a rule, the equality of expected values for alternative choices. However, several students of risk taking behavior have argued that such a strategy may measure probability preferences which are not necessarily identical with risk taking (11).

Figure 1: The Payoff Matrix for the Second Series

Instructions: Make a guess from A, B, C, D, E, F and write down your guess in the appropriate rectangle. Pay careful attention to the instructions, so that it will be clear what you are supposed to write down in the rectangle corresponding to your choice. By choosing alternative A you are betting that the drawn card will belong to any of three suits which you will choose out of the 4 possible ones. Alternative B requires you to guess whether the drawn card will be from the black or red suits. In alternative C you are supposed to guess to which of the 4 suits the drawn card will belong, spades, hearts, clubs or diamonds. By choosing alternative D you are betting that the card to be drawn will be a royal figure (either a king or a queen). Any other card will make your guess wrong. In alternative E you are betting that the drawn card will be a human image (either a king or a queen or a Jack). However, you have to guess whether this image will belong to the black or red suits. For alternative F you will guess the number of the card. There are 12 groups of 4 cards with an identical number. The numbers range from 2 to 13 (the Jacks are assigned the number 11, the queens — the number 12 and the kings — the number 13).

The following table indicates the chance of correct guessing for each alternative. It also instructs you about the amount of money you may win if your guess is correct, or lose if your guess is wrong.

Payoff Matrix

Guess	Chance of guessing correctly	Gains	Losses
A. Three suits of of the four	3 in 4 = 75%	2 agoroth	3 agoroth
B. Black or Red	1 in 2 = 50%	6 "	6 "
C. Spades or Hearts or Clubs or Diamonds	1 in 4 = 25%	12 "	8 "
D. Royal figure	1 in 6 = 17%	18 "	9 "
E. Colour of human image	1 in 8 = 12.5%	24 "	12 "
F. Number of the card	1 in 12 = 8.5%	36 "	18 "

If our subjects had approached this test rationally, all of them would have preferred alternative A with its positive expected value, and for the sake of variation, the alternatives B or C with their corresponding expected values of 0 and -3, but never the last 3 alternatives with their low expected values of -4.5, -7.5 and -13.5. Choices of the middle or low probabilities are, therefore, a clear indication of an irrational tendency of risk taking.

b. Physical risk. We employed the same technique in the present study as in our previous studies. Subjects were instructed to make 10 choices among 3 holes in an electrified metal platform with diameters of 8, 6.5 and 5 mms. They were supposed to insert a metal stylus in the chosen hole. A successful performance consisted of inserting the stylus

in a hole, holding it there for 20 seconds and then withdrawing it without making contact with the edges more than 4 times. Each contact with an edge would cause a bell to ring and would give the subject an electric shock. After one demonstration performed by the experimenter the subject was asked to make his 10 choices. Unlike the procedure in our previous studies, the subject was then instructed to execute his choices, but was allowed to change any choice either in the direction of greater risk or in the direction of smaller risk.

c. Risk of prestige. Instructions and procedures of administration were identical to those which were employed previously. Subjects were brought together in groups of 4 and told that they would be given a standard measure of "leadership and efficient intellectual functioning". They were further informed that the total test was comprised of 10 subtests, each containing easy and difficult items. Each subtest would be given separately and the subject would choose to answer only one of the items. A correct answer to a difficult item would, of course, credit him with more points than an easy item, but the chances of answering a difficult item correctly were much smaller than the ones for an easy item.

The new version of the test differed from the old one by having 3 instead of 2 items in each subtest, one easy item, one of moderate difficulty and one of great difficulty. After instructions and a demonstration with an exemplary subtest, subjects were asked to write their 10 future choices on a sheet of paper. However, after the completion of choices, and before the administration of the first subtest, the sheets of paper with the anticipating choices were removed under some pretext, and the subjects were told to make a second choice for the first subtest, which may or may not be identical with their first choice. They were subsequently asked to make choices for each subtest after the completion of a preceding subtest.

D. Results and Discussion

1. Ambivalence

Ambivalence, as any other human attitude or trait, can be analyzed from four points of view: (1) its intensity, (2) its generality, (3) its universality and (4) its relatedness. The operational definition of the intensity of an attitude expressed by an individual or a group is its distance from some predetermined point of strength. This point may represent a real or an arbitrary norm. The concept of intensity is greatly overlapping with generality. Since an individual's score on a personality inventory of an attitude scale is a result of his responses to a number of items which represent a variety of situations, a high score is clearly an indication of high generality and vice versa. This is especially true where responses to items are dichotomous (e.g., yes-no). However, even when items are constructed in such a manner as to measure the strength of the individual's response, the alternatives measuring the differential strength of behavior or feelings convey the meaning of generality over time or situations. It is justified, nevertheless, to view intensity separately from generality and to relate the intensity to a definable unit of behavior at a given time, and to relate generality to the validity of this behavior across several definable behavior units and/or several time periods.

The universality of a trait or attitude represents its applicability or generality for various types of individuals or groups. The relatedness of a trait or attitude represents its power to predict related types of behavior.

Our findings for the ambivalence test are analyzed from these four points of view.

a. The intensity of ambivalence. Psychoanalysis (9) hypothesizes considerable sex differences in the nature and resolution of the Oedipus complex. It predicts that males should reveal greater ambivalence towards their fathers than toward their mothers, whereas females should show a reversed trend. Females are expected in general, to demonstrate more ambivalence than males. Some support for a tendency of greater ambivalence of a person toward the parent of the same sex was obtained in our first study on ambivalence (8). The male and female samples of the present study reveal a similar trend, However, the differences are not significant. Neither of our studies on ambivalence shows a tendency for either of the sexes for overall greater ambivalence.

b. The generality and universality of ambivalence. The generality of ambivalence was indicated in our previous studies by consistent inter-correlations of ambivalence scores for the 10 figures of the test. The same fact is revealed in the two samples of our present study. This is illustrated in Tables 1 and 2.

Table 1: Intercorrelations between Ambivalence Scores for Male College Students

[illegible]

Table 2: Intercorrelations between Ambivalence Scores for
Female College Students

	F. M.	B.	S.	Self	Com.	M.T.	F.T.	Cong.	M.W.	Total
1. Father	.38	.48	.34	.21	.00	.38	.27	.17	.27	.59
2. Mother		.51	.43	.30	.00	.27	.35	.35	.30	.66
3. Brother			.47	.33	.00	.44	.50	.23	.57	.77
4. Sister				.00	.18	.12	.50	.44	.40	.60
5. Self					.16	.26	.00	.20	.27	.52
6. Commander						.00	.17	.00	.14	.21
7. Male Teacher							.47	.00	.47	.61
8. Female Teacher								.14	.38	.64
9. Congressman									.35	.52
10. Matronly woman										.72

The overall picture is similar to the one which has been portrayed in the previous samples. This yields additional evidence for two aspects of our research: (1) the reliability of our test for measuring conflicting attitudes toward parents, parental surrogates and siblings which is defined in the literature as ambivalence and (2) the generality of the ambivalent attitude which is hypothesized by Freud (8).

Several peculiarities of the two samples should be mentioned. The two samples show a somewhat smaller degree of generality than the first college samples of our previous study, in which both sexes

were mixed together. Unlike our first study on ambivalence (8), the males show a greater degree of generality than the females. In our previous studies the mother figures carried the highest intercorrelations. In the present study this figure is replaced by the father figure.

The females in the present sample seem to show a greater discrimination between figures. Both sexes show only a slight degree of generality in their responses to self which is consistent with our previous findings(10). However, with regard to the remaining figures, the males demonstrate a high degree of homogeneity while the females behave according to a gradient of generality; personally more meaningful figures (family members, teachers) are more intercorrelated than figures which have less personal meaning (army commander, congressman).

We may summarize by saying that the ambivalent attitude as measured by our test reveals a considerable degree of generality across various figures and a fair degree of universality. The latter is shown by the similar patterns of responses of samples from different countries (our first two samples for whom the test was constructed were American college students) and with different backgrounds. Whether the sex differences in the degree of generality of ambivalence is real for the population of Israeli college students or peculiar to our samples remains to be seen in a replication study.

c. The predictive power of ambivalence. Our previous studies suggested that the trait of ambivalence as defined by our test may possess great power for the prediction of a variety of behaviors in the areas of perception, risk taking and several personality traits.

i. Ambivalence and socialization. The previous studies (8, 10) indicated a clear connection between ambivalence and socialization

practices as perceived and recalled by subjects. Individuals with high ambivalence scores tended to remember more punitive experiences in childhood (small frequencies of parental reward and corporal punishment rather than psychological discipline). The results in the two samples of the present study, especially of the female sample, are somewhat less clear cut.

Correlations between ambivalence scores and psychological discipline of the father for the male sample are either zero or in the predicted direction although quite small. A clearer picture is obtained for psychological discipline of the mother as can be seen in Table 3.

Table 3: Correlations between Parental Discipline and Ambivalence for Male College Students¹

Ambivalence Scores	Psych. Discipline by:		High Frequency of Reward by:	
	Father	Mother	Father	Mother
1. Father	.00	.00	-.30	.00
2. Mother	.00	.00	.00	.00
3. Brother	.00	-.43*	-.15	.00
4. Sister	.00	-.38*	.00	-.11
5. Self	.00	-.16	.00	.10
6. Commander	-.17	-.39*	-.14	-.15
7. Male Teacher	-.19	-.37*	-.26	.00
8. Female Teacher	.00	-.20	-.11	-.25
9. Congressman	-.12	-.32*	-.17	.00
10. Matronly Woman	-.19	-.14	-.10	.00
11. Total	.00	-.32*	-.18	.00

1. Asterisks denote correlations with p.values < .05 on a two-tail test

The influence of maternal discipline on ambivalence and other types of behavior has been demonstrated in our previous studies and should be expected from various theoretical discussions of socialization. The fact that the impact of parental discipline on ambivalence is demonstrated in our male sample, not toward the parents themselves but rather toward siblings and parental surrogates, may be a peculiarity of this sample only. In previous studies the connection between the type of discipline and ambivalence toward parents was, as a rule, stronger for parents than for other figures.

In the female sample all correlations between the type of parental discipline and ambivalence are zero or very small and inconsistent. On the other hand, frequency of parental reward shows relatively strong relationships in the predicted direction as shown in Table 4.

Table 4: Correlations between the Frequency of Parental Reward and Ambivalence for Female College Students¹

Ambivalence Scores	High Frequency of Parental Reward by	
	Father	Mother
1. Father	-.24	-.33*
2. Mother	-.17	-.27
3. Brother	-.32*	-.18
4. Sister	-.17	-.00
5. Self	-.30*	-.44*
6. Commander	-.15	-.14
7. Male Teacher	.00	-.12
8. Female Teacher	.00	-.14
9. Congressman	-.20	-.24
10. Matronly Woman	-.32*	-.36*
11. Total	-.34*	-.34*

1. Asterisks denote correlations with p. values $< .05$ on a two-tail test.

We may conclude that in general our previous findings on the relationships between ambivalence and the type of parental discipline or the frequency of rewards have been replicated. It should be noted, however, that our information about the socialization practices of parents has been represented by the perceptions of subjects. The degree of correspondence between these perceptions and the real past is a topic for investigation.

ii Ambivalence and risk taking.

(a) Review of the previous study. Before we report and analyze the findings concerning the connections between ambivalence and risk taking, let us summarize briefly our previous findings.

The financial risk test in our previous study was composed of 3 parts: (1) 10 probability choices without bets, (2) 10 similar choices with money bets but with no feedback and (3) 10 bets with feedback about the outcome after each choice. Correlations between ambivalence and the behavior of the subjects in the three samples were practically zero. The same was true for the correlations between ambivalence and the responses of two samples in the second part of the test. However, one sample (soldiers) indicated a consistently positive trend between the two variables; all correlations were positive, although only two of them reached significance. The trend of positive relationships between ambivalence scores and financial risk was much clearer in the third part of the financial risk test, especially for the soldier sample.

Results of prestige and physical risk taking were negatively correlated with almost all ambivalence scores. A considerable number of these negative correlations was significant.

The interpretation which we offered for these results was that the risk tests of prestige and physical pain resembled life-like situations

to a greater extent, and were more anxiety provoking than the test of financial risk. Since individuals with high ambivalence scores tend to be more anxious than individuals with low ambivalence scores, they are more likely to refrain from taking great risks in situations which may cause them to lose face or be exposed to physical discomfort. The financial risk test is less threatening and less realistic since the subject may lose only small sums of money which were not their own in the first place. This test differs from the other two tests in another important aspect; it is based on sheer luck rather than on skills or abilities. Since individuals with high ambivalence tend to be more externally controlled than individuals with low ambivalence, they will demonstrate a greater tendency to rely on blind luck and behave more irrationally in situations where outcomes are determined by external forces (10).

We will analyze now our findings for the two new samples and we will compare them with the previous findings.

(b) The male sample. The same trend which was found in the financial risk test in the previous samples was demonstrated in the male sample, but with smaller correlations. Out of the 27 computed correlations between ambivalence scores and responses on the three parts of the financial risk test, 11 correlations are zero and the remaining 16 are all positive ranging from .10 to .34 with a median of .20. The relationships between ambivalence and risk of prestige for the male sample are also in the same direction as for the previous samples. Eleven of the 22 computed correlations between the ambivalence scores and the two parts of the risk test (without feedback and with feedback) are zero, and the remaining 11 correlations are all negative ranging from -.10 to -.27 with a median of -.15.

The relationships between ambivalence and physical risk for the male sample seem to be somewhat different from those of the college

student sample in the first stage of our project. It will be remembered that in the first stage of our project only the college sample was exposed to the physical risk test. The subjects, males and females, were informed about the nature of the test and were instructed to make 10 choices among the 3 holes for inserting the metal stylus. They were not asked, however, to perform. In the present study, on the other hand, subjects were required after their 10 choices to make a real performance, but they were allowed to change their choice after each performance. If we compare now the two samples as to correlations between the 10 choices of physical risk without feedback and the scores of ambivalence and hostility, we find them quite similar. The mixed sample of college students in the first stage of the project showed 12 zero correlations and 9 negative correlations (2 of which were significant) out of 22 possible correlations. Exactly the same result was obtained for the male sample of the present study; 11 correlations were zero and the remaining 9 were negative. However, they were much smaller than in the former sample (ranging from $-.10$ to $-.17$). The picture is entirely different in the second part of the test. Here the great majority of the correlations are positive, as can be seen in Table 5.

The possible explanation for the reversed trend may be that the present sample differed from the sample in the first stage of the project in two respects. All subjects in the present sample were males and all of them were recruited from the undergraduate courses of the Psychology Department. As will be shown later, males generally tend to take somewhat greater risks than females, and when the danger is not too overwhelming, anxious males may even over-compensate and demonstrate their courage by taking greater risks.

Table 5: Intercorrelations between Physical Risk and Scores of Ambivalence and Hostility for Male Students¹ :

Figure	Ambivalence	Hostility
1. Father	.27	.00
2. Mother	.17	.14
3. Brother	.13	- .27
4. Sister	.18	.20
5. Self	.32*	.12
6. Commander	.00	.22
7. Male Teacher	.00	.00
8. Female Teacher	.17	.24
9. Congressman	.19	.00
10. Motherly Woman	.00	.36*
11. Total	.25	.18

1. Asterisks denote correlations with p. values $< .05$ on a two fail test

This may have been especially true for the males in our sample who, as psychology students, were test-wise and knew from their studies that shock experiments do not represent a real danger. They were familiar not only with this type of test but also knew the experimenters and were confident that the latter would not possibly cause them too much pain. This may have decreased the connection between the choices of the subjects and their permanent conflict dispositions of ambivalence and anxiety in the first part of the test. Eventually, when the subjects were exposed to the performance of the test and realized that the pain caused by the electric shock was "bearable", those with

high ambivalence conflict tended to overcompensate their slight apprehension and made more risky choices. This behavior served to raise their own feelings of self-esteem and to gain recognition from the experimenters with whom they were acquainted.

If these explanations are correct, then several conclusions are self-evident. First, this type of test is appropriate only for completely naive subjects. For less naive individuals, a more stressful situation is needed to investigate behavior of physical risk. Second, persons may behave differently in situations of anticipation of danger than in situations in which the consequences of the danger are actually experienced. Empirical investigations should, therefore, treat the two types of situations separately.

(c). The female sample. The sample of female college students seemed to behave differently in the first and second part of the financial risk test (probability choices first without and then with money bets) than in the third part of the test (bet choices with a fixed probability). The ambivalence scores of this sample correlated negatively with high risk responses (choices of low probabilities) in the first two parts but positively with the risk choices (high bets) in the third part. The correlations are given in Table 6.

A comparison of these results with the results of the male sample, and the previous samples shows that females with high ambivalence behave in the third part of the financial risk test in a similar manner to males with high ambivalence i.e. they tend to take somewhat greater risks than females with low ambivalence although this trend is less strongly pronounced than it is for males. However, the behavior of ambivalent females in the first two parts of the test is distinctly in the

opposite direction from the behavior of ambivalent males i.e. they refrain from choosing low probabilities regardless of whether money bets are or are not attached to these probabilities.

Table 6: Correlations between Ambivalence Scores and High Risk Responses on the Financial Risk Test for Female College Students¹:

	<u>High Risk Responses</u>		
	<u>Part I</u>	<u>Part II</u>	<u>Part III</u>
1. Father	-.51*	-.38*	.11
2. Mother	-.46*	-.32*	.00
3. Brother	-.39*	-.15	.17
4. Sister	-.39*	-.23	.00
5. Self	-.35*	-.19	.20
6. Commander	-.15	-.18	.00
7. Male Teacher	-.16	.00	.15
8. Female Teacher	-.13	-.11	.15
9. Congressman	-.18	.00	.15
10. Matronly Woman	-.34*	.00	.00
11. Total	-.52*	-.29	.29

1. Asterisks denote correlations with p.values $< .05$ on a two tail test.

In the prestige risk test the female subjects behaved in the predicted direction. Females with greater ambivalence tended to take smaller risks than females with low ambivalence, as can be seen in Table 7.

Table 7: Correlations between Ambivalence and Risk of Prestige for College Female Students¹:

	<u>Risky Choices of Prestige</u>	
	Without Feedback	With Feedback
1. Father	-.29	.00
2. Mother	-.14	.00
3. Brother	-.13	-.12
4. Sister	.00	.00
5. Self	-.29	-.22
6. Commander	-.37*	-.47*
7. Male Teacher	-.18	-.18
8. Female Teacher	-.10	-.16
9. Congressman	-.30*	-.31*
10. Matronly Woman	.00	-.35*
11. Total	-.32*	-.32*

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

The results of the physical risk test for the female sample are inconclusive. Correlations between ambivalence and the tendency to take high risk are zero or very small and inconsistent.

Our previous findings about the trend of a negative relationship between ambivalence and physical risk were based on one sample of volunteering college students from various departments in the University. Since we failed to duplicate these findings with the two samples of male and female college students (psychology majors), we will exclude the physical risk test at this stage from the analysis of the relationships between ambivalence and risk behavior. Additional investigation

is needed in which different types of samples as well as a different type of physical risk will be employed. We will concentrate here solely on our data on financial risk and risk of prestige.

We may state with a high degree of confidence that risk of prestige, as it is measured in our studies, is negatively correlated with ambivalence and to a lesser extent with hostility towards parents, parental surrogates and siblings. This finding has been duplicated in 5 samples, although with different degrees of strength. In risk situations, where outcomes are connected with financial gains and losses and determined by luck rather than by ability, ambivalent males tend to take a somewhat greater risk. Ambivalent females seem to respond in a manner similar to their behavior in situations of prestige risk; they have the same feelings of apprehension and refrain from choosing low probabilities.

In the third part of our test, in which the probability was fixed, and subjects were required to choose the size of their bets, ambivalent females tended somewhat to reverse their behavior and to take, like ambivalent males, greater risks than subjects with low ambivalence. Whether this finding is a stable phenomenon remains to be seen in a future study.

iii. Ambivalence and perception

(a). Field dependence. The three samples of the first stage in our project failed to demonstrate clear-cut relationships between ambivalence scores and field dependence. We decided, nevertheless, to try out this test again in our present male sample. We correlated the field dependence scores which have been derived from the Witkin EFT with the scores of ambivalence and hostility. The results are given in Table 8.

Table 8: Correlations between Scores of Ambivalence and Hostility and Field Dependence for Male College Students¹:

Figures	Ambivalence	Hostility
1. Father	.34*	.31*
2. Mother	.24	.00
3. Brother	.26	-.14
4. Sister	.00	.00
5. Self	.00	-.20
6. Commander	.50*	.27
7. Male Teacher	.28	.00
8. Female Teacher	.42*	-.20
9. Congressman	.28	-.27
10. Matronly Woman	.12	.00
11. Total	.35*	.00

1. Asterisks denote correlations with p. values $< .05$ on a two-tail test.

It can be seen that with this male sample our predictions about the positive relationship between field dependence and ambivalence were supported: out of the 11 correlations only two are zero, all the remaining are positive and 4 of them are significant. A less clear picture is obtained for hostility scores. We are planning to investigate in the future the connection between field dependence and ambivalence for female subjects.

(b). Intolerance of ambiguity. The college student sample in the first stage of the project was given the Smock Ambiguity Task (12) which consists of 5 series of pictures each with 15 samples beginning with vague outlines and gradually becoming articulate. The index for intolerance of ambiguity suggested by Smock is the serial number of the picture to

which the first response is given. We used a modification of this index — the number of responses in each series. A high frequency of responses is an indication of intolerance for ambiguity because it reveals a tendency for premature closure and a hasty urge to seek meaning with an insufficient amount of information.

The college sample did not show the expected connection between ambivalence and this score. However, another score of the test — the number of incorrect responses in a series did show a slight trend of positive relationships with ambivalence. Smock interprets this type of score as an index for perceptual inefficiency, but it can also be viewed as another indication for intolerance of ambiguity. When the number of responses in a series is held constant, individuals with a high degree of intolerance for ambiguity will tend to be more hasty in the interpretation of a picture and will, therefore, make more errors.

Table 9: Correlations between Ambivalence and Intolerance of Ambiguity for Male College Students¹:

Figures of ambivalence	Number of responses	Number of incorrect responses
1. Father	.17	-.11
2. Mother	.00	-.15
3. Brother	.19	-.34*
4. Sister	.30	-.23
5. Self	.38*	-.36*
6. Commander	.00	-.10
7. Male Teacher	.24	.00
8. Female Teacher	.15	-.14
9. Congressman	.00	-.20
10. Matronly Woman	.17	-.17
11. Total	.19	-.17

1. Asterisks denote correlations with p values $\leq .05$ on a two-tail test.

We find in Table 10 a consistent, although not strong, relationship between ambivalence and intolerance for ambiguity as determined by the number of responses given. This can be viewed as some support for the hypothesized relationship between ambivalence and intolerance for ambiguity. On the other hand, the number of incorrect responses — which we interpreted as a second index for intolerance of ambiguity — shows negative relationship with ambivalence. Perhaps perceptual efficiency is independent of intolerance for ambiguity. In this study perceptual efficiency has a low positive correlation of .29 with the index of intolerance of ambiguity (the high frequency of responses in a series).

iv. Ambivalence and anxiety. Both males and females demonstrated positive relationships between anxiety scores on the Taylor MAS and scores of ambivalence and hostility, but the correlations were considerably smaller than the ones which were obtained for the first college sample. The correlations for both samples are given in Tables 10 and 11.

Table 10: Correlations of MAS Scores with Ambivalence and Hostility Scores for the Male Sample¹:

Figure	Ambivalence	Hostility
1. Father	.16	.00
2. Mother	.00	.00
3. Brother	.20	.00
4. Sister	.39*	.33*
5. Self	.18	.38*
6. Commander	.30	.32*
7. Male Teacher	.00	.13
8. Female Teacher	.15	.27
9. Congressman	.22	.47*
10. Matronly Woman	.00	.44*
11. Total	.29	.40*

1. Asterisks denote correlations with p-values $< .05$ on a two-tail test.

Table 11: Correlations of MAS Scores with Scores of Ambivalence and Hostility for the Female Sample¹:

Figure	Ambivalence	Hostility
1. Father	.30	.10
2. Mother	.00	.37*
3. Brother	.24	.24
4. Sister	.35*	.00
5. Self	.14	.39*
6. Commander	.00	.15
7. Male Teacher	.35*	.33*
8. Female Teacher	.35*	.32*
9. Congressman	.00	-.11
10. Matronly Woman	.32*	.11
11. Total	.30	.32*

1. Asterisks denote correlations with p.values $< .05$ on a two-tail test.

Although the general direction of the correlations is the same as in our previous samples, two important differences should be noted.

1. The strongest correlations in our previous samples were obtained for the scores of ambivalence toward parents, especially toward the mother. In the present samples the correlations between anxiety and ambivalence toward the father are relatively small and toward the mother they are zero.

2. In our previous samples anxiety was more highly correlated with ambivalence than with hostility. This was interpreted to mean that hostility in itself arouses less anxiety than the ambivalent conflict between positive and negative feelings. Such an interpretation is less valid for the present samples since hostility scores show a somewhat stronger relationship with anxiety than ambivalence scores.

It is possible that here, as in the risk taking situations, the sophistication of the subjects in psychological problems and tests biased their natural response tendencies to some degree. This would explain both differences of relationships which have been mentioned earlier. Subjects, who in spite of their sophistication were frank enough to admit hostile feelings, tended also to be more frank in admitting feelings of anxiety. On the other hand, ambivalent subjects for whom feelings of hostility were in conflict with positive feelings, could be caught off guard more easily on the semi-projective ambivalence test than on the direct anxiety questionnaire. This decreased and in some instances even concealed the connection between responses of ambivalence and anxiety.

v. Ambivalence and dogmatism. In our previous studies the college sample showed correlations of .47, .38 and .35 between dogmatism and ambivalence toward father, mother and total ambivalence respectively. The same trend was found for the Kibbutz and soldier samples, but the correlations were relatively small. However, the positive relationships between the two variables have not been duplicated in our present samples. Actually, both samples show a slightly reversed trend.

vi. Ambivalence and verbal fluency. The task in the first part of the ambivalence test was to list quickly 10 adjectives for each of the 10 figures while the experimenter noted blocking by the subjects. After he completed the list of adjectives, the subject was required to rate them for like, dislike and indifference. A week later he was asked to repeat his ratings. The 4 indices of ambivalence in this part of the test are the total time the subject blocks for each figure, the relative proportion of positive and negative adjectives, changes in the two adjective ratings and the number of unusual ratings of adjectives.

An argument could be advanced that the first two indices may be determined by verbal fluency rather than by conflict and defensiveness. To investigate such a possibility, a verbal fluency test was administered to both samples. The subjects' scores on this test were correlated with the 10 ambivalence scores as well as with the 4 indices for each of three figures: father, mother and self.

Out of the 10 correlations between verbal fluency and ambivalence for males three are zero, the remaining 7 are negative. Only one correlation is sizeable and significant ($-.39$) while all the others are quite small; the mean correlation is only $-.15$. A similar pattern is found for the female sample. Two out of the 10 correlations are zero and only one correlation is negative and significant ($-.39$). All the remaining 7 correlations are also negative but small. The mean correlation is $-.17$.

An analysis of the correlations between verbal fluency and the separate indices of ambivalence for the three figures shows that the largest part of the relationship between verbal fluency and ambivalence could be accounted for by the contribution of the "blockings" and a small part of it by the proportion of positive and negative adjectives.

We may conclude, then, that verbal fluency does play a role in the ambivalence test, but accounts for only a negligible part of the variance (less than 4%).

vii. Ambivalence and social desirability. Another possible argument against the validity of the ambivalence test is that high and low scores do not necessarily reflect high and low ambivalence respectively. The interpretation of scores should perhaps be entirely reversed. Possibly, individuals with low scores have a high ambivalence conflict, but by using strong defenses they succeed in concealing their conflict.

As we were concerned with such a possibility during test construction, the test was composed of two parts with different levels of spontaneity or consciousness. The second part of the test uses a semantic-differential technique with no time control. With this technique, a defensive subject is able to disguise his hostilities and conflicts to some degree. The first part of the test is projective: here defensive tendencies can be traced with relative ease and taken into account by an appropriate scoring procedure.

Although the structure of the test and its scoring stem are based on theoretical notions of ambivalence and a series of studies (8, 10) render high construct validity to our test, we decided to investigate this problem directly. We administered the Marlow-Crowne Social Desirability Scale to the female sample. High scores on this test are interpreted by the authors (1) as an indication not only of a need for maintaining self-esteem and a need for social approval but also of defensive tendencies.

In Table 12 we give the correlations between scores of social desirability and scores of ambivalence and hostility for the female sample.

The correlation table shows a clear connection between hostility and social desirability. Individuals with high scores of social desirability tend to express less hostile feelings in their ratings of the figures than individuals with low social desirability scores. Two interpretations of this relationship are possible. One is that individuals with high M-C.S.D. scores and low hostility scores are really hostile but defensive. Another possible explanation is that because they were defensive and had a high need for social approval (perhaps already during childhood) these individuals renounced their hostilities and resentments.

Table 12: Correlations between M-C.D.S. Scores and Scores of Ambivalence and Hostility for the Female Sample:¹

<u>Figure</u>	<u>Ambivalence</u>	<u>Hostility</u>
1. Father	-.16	-.36*
2. Mother	..00	-.25
3. Brother	-.30	-.27
4. Sister	-.29	-.22
5. Self	..00	-.27
6. Commander	.00	-.18
7. Male Teacher	-.16	-.19
8. Female Teacher	-.24	-.39*
9. Congressman	.00	.00
10. Matronly Woman	-.25	-.25
11. Total	-.20	-.41*

1. Asterisks denote correlations with p. values $< .05$ on a two-tail test.

At any rate, the ambivalence scores in our test, which are composed mostly of vacillations between hostility and affection, are influenced by social desirability only to a slight extent. Four of the 11 correlations are zero and the 7 negative correlations are relatively small. Furthermore, a detailed analysis of the relationships between scores of social desirability and the 6 ambivalence indices indicates that the 4 indices of ambivalence on the adjective test are influenced to a

much lesser degree by the need for social approval than the 2 indices in the semantic differential. The most obvious index of defensiveness, the "blockings" (reaction-time for adjectives) is not correlated with the M-C.S.D. scores for the father figure and the correlation for the mother figure is very small.

We may conclude, then, that the ambivalence test is influenced only to a small extent by such variables as verbal fluency and social desirability. The greatest part of the variance is determined by a general tendency to vacillate between positive and negative attitudes toward significant figures.

d. Summary.

A considerable part of the findings on ambivalence from the first stage of the project was duplicated in the present study:

- (1). Ambivalence is a generalized trait of conflicting attitudes toward significant figures which can be objectively measured by a semi-projective technique and which can be isolated from direct hostility.
- (2). Psychoanalytic contentions about sex differences with regard to intensity or generality of ambivalence are not supported by our studies.
- (3). High ambivalence is connected with punitive socialization practices in childhood as reported by subjects.
- (4). Ambivalence is accompanied by feelings of anxiety which are aroused by hostile attitudes as well as by the very presence of conflict.
- (5). There are some indications of a positive relationship between perceptual rigidity, intolerance of ambiguity and ambivalence.

- (6). Males and females with high ambivalence tend to take smaller risks in situations where outcomes are determined by abilities and are connected with self-esteem and prestige.
- (7). It is possible that ambivalent males and females differ in their behavior in financial and physical risk situations. The apprehension of ambivalent females in risk situations seems to be more general, while ambivalent males tend to be more adventurous than non-ambivalent males in financial and physical risk situations.

2. Risk Taking Behavior.

As has already been done for ambivalence, it is possible to describe and analyze risk taking tendencies in terms of intensity, generality and predictability.

a. The intensity of risk taking tendencies. Since no standard test for risk taking tendencies is available, the intensity of this trait in an individual or a group can be evaluated only in terms relative to other individuals or groups of individuals who were exposed to the same test. Since the risk tests of the present study differ considerably from the tests of the previous study, it is possible to compare means of the two new samples but no comparison can be made with the means of the previous samples. A comparison between the means of all risk tests in the present study shows a consistent tendency for males to take more risks than females, although none of the mean differences meets an accepted significance criterion.

The following table contains the means of risk for both samples:

Table 13: Mean Risk Scores for the Male and Female samples:

Sample	No.	Financial risk			Prestige risk		Physical risk	
		Part I	Part II	Part III	Part I	Part II	Part I	Part II
1. Males	35	27.06	32.43	20.75	21.69	22.09	22.11	21.97
2. Females	39	26.68	28.51	20.50	21.24	21.48	17.59	18.25

The tendency of both sexes to be more cautious in the first part of the financial and prestige risk tests, in which 10 choices are made before the first performance, is worthy of note. Both males and females become more adventurous in the second part of the tests in which each choice is connected with a wager and preceded by feedback from the previous choice.

In the physical risk test, however, both sexes tend to become somewhat more cautious after having experienced electric shock.

b. Generality of risk taking behavior. As in the previous study only a slight degree of generality of risk taking tendencies is shown by both samples. This can be seen in Tables 14 and 15.

Both tables contain relatively high correlations between sub-tests but low positive zero, and in a few instances low negative correlations among tests. The female sample demonstrates a somewhat greater degree of generality. This was also reflected in the correlations between ambivalence and risk taking which show an overall tendency for these two variables to be related negatively. Males, on one hand, evidence some degree of generality only for financial and physical risk, which correlated

positively with ambivalence. On the other hand, most correlations of the prestige risk test with the other tests, are either zero or negative, which was also reflected by its reversed (negative) relationships with ambivalence.

Table 14: Correlations Between the Risk Tests for the Male Sample¹:

	1	2	3	4	5	6	7
1. Financial risk — part I		.68*	.40*	-.19	.00	.26	.35*
2. " " — part II			.38*	-.24	.14	.24	.31*
3. " " — part III				-.12	.00	-.11	.11
4. Prestige risk — part I					.78*	.00	-.23
5. " " — part II						.26	.00
6. Physical risk — part I							.71*
7. " " — part II							

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

Table 15: Correlations Between the Risk Tests for the Female Sample¹:

	1	2	3	4	5	6	7
1. Financial risk — part I		.55*	-.16	.22	.42*	.22	.00
2. " " — part II			.00	.35*	.17	.24	.10
3. " " — part III				.17	.14	.12	.15
4. Prestige risk — part I					.63*	.24	.27
5. " " — part II						.26	.25
6. Physical risk — part I							.75*
7. " " — part II							

Asterisks denote correlations with p. values $< .05$ on a two tail test.

c. Correlates of risk taking tendencies. The results in the first stage of the project showed that field dependence, anxiety, authoritarianism and dogmatism correlated negatively with all risk taking tests. This was true for all three samples.

In the college and army samples negative relationships were found between high financial and prestige risk on one hand and psychological discipline and frequent parental reward on the other hand. The correlations between these variables for the kibbutz sample were small and inconsistent. The college students who were also given the physical risk test showed a reversed direction of relationships between parental discipline and physical risk scores.

The relationships for risk responses of the male sample in the present study are quite similar, but the correlations are somewhat

smaller. Physical risk is positively correlated with high frequency of parental reward and with psychological discipline of parents. Out of 8 possible correlations only 1 is zero, the remaining correlations are positive and 2 of them are significant. As in the previous study, physical risk is correlated negatively with anxiety and field dependence, but the correlations are not significant. No connection was found in the present sample between dogmatism and physical risk.

The relationships between the other two types of risk and parental discipline in the present study were inconsistent. The males showed negative correlations of $-.41$ and $-.15$ between anxiety and the first and second part of the prestige risk respectively but no relationship with financial risk. Field dependence was negatively correlated with both risk tests. All 5 correlations were negative and 2 of them significant ($-.34$ with the second part of the prestige risk and $-.47$ with the third part of the financial risk). Dogmatism was not related with risk of prestige. Its correlations with financial risk were positive instead of being negative as in the previous studies.

The female sample, similarly to the males did not demonstrate a relationship between parental discipline and risk of prestige or physical pain. On the other hand, high financial risk was correlated negatively with high frequency of reward and psychological discipline of parents, although here also some inconsistency was found for the third part of the test.

Similarly to the males they showed a small negative relationship of anxiety with physical risk and risk of prestige but not with financial risk. They also failed to demonstrate the previously found negative relationship between risk and dogmatism.

A noteworthy finding for the female sample is the positive relationship between social desirability (as measured by the Social Desirability Scale) and physical risk (a correlation of .38 with the first part and .50 with the second part). Apparently, subjects with a high need for social approval were willing to take high risk of experiencing physical pain in order to make a good impression on the experimenter.

The correlations between social desirability and risk of prestige are also positive but small, perhaps because the test was administered in small groups and no personal contact was established between the subjects and the experimenter. The correlations with financial risk are small and negative although the financial risk test was given individually. This is probably because subjects did not perceive responses of high risk in gambling as a means for winning the experimenter's recognition.

d. Summary.

A negative relationship between field dependence and risk taking behavior was found in both stages of our research. The negative relationship between risk and anxiety was duplicated in the present study for physical risk and risk of prestige but not for financial risk. The negative relationship between risk and dogmatism was not found in the present study.

The negative correlation between physical risk and punitive discipline of parents was duplicated in the male sample but not in the female sample. A positive correlation was found between social desirability and physical risk and, to a smaller degree, with risk of prestige.

Males tended to take a somewhat higher risk than females on all

tests. Both sexes showed a certain degree of generality within types of risk but a high degree of specificity between types of risk.

3. Correlates of Perceptual Variables

a. Field dependence. In the present study the test of field dependence was administered only to the male sample. Unlike the previous samples the present sample demonstrated a consistent positive relationship between field dependence and ambivalence. Out of the 11 correlations only 2 were zero (for sister and self). The remaining 9 were positive, ranging from .12 to .50. Field dependence was also related with parental discipline in the expected direction. The correlations with high frequency of reward for father and mother are -.33 and -.31 respectively. In the predicted direction were also the correlation of .29 between field dependence and anxiety, as well as the correlation of .48 between the field dependence and intolerance of ambiguity, as measured by the number of responses on the Smock Ambiguity Task.

b. Intolerance of ambiguity. We have already discussed earlier the relationships between the indices of intolerance of ambiguity in the Smock test and ambivalence. The same pattern of correlations is found for parental discipline. The number of responses is correlated negatively with high frequency of parental reward and with psychological discipline of parents and positively with high frequency of parental censure and with the corporal type of punishment. Out of 8 correlations 3 are significant to the .05 level. MAS scores are also positively correlated with intolerance of ambiguity, but the correlations are not significant. The same relationship is also demonstrated for dogmatism.

4. Correlates of Anxiety

The positive relationships which were found for manifest anxiety

with ambivalence, hostility, field dependence and intolerance of ambiguity and the negative relationships with physical risk and risk of prestige have been discussed in the preceding sections.

High manifest anxiety was also correlated with socialization practices of parents as reported by males. The correlations between anxiety and psychological discipline of the father and the mother are $-.45$ and $-.48$ respectively. The opposite is true for corporal punishment. The correlations between anxiety and corporal punishment of the father and the mother are $.36$ and $.31$ respectively. All 4 correlations are significant and in the predicted direction. The other 2 variables of socialization, the high frequencies of parental reward and punishment are also correlated significantly with anxiety, but both correlations are positive ($.40$ and $.62$ respectively). This contradiction may be more apparent than real. The items in the biographical questionnaire asking about frequencies of parental rewards and punishments were independent and subjects could answer both of them in the same direction. It may well be, therefore, that subjects who experienced inconsistent behavior of parents during childhood developed greater tendencies to be anxious. However, this finding was observed neither in the female sample nor in our previous samples.

A noteworthy finding is the correlation of $-.50$ between social desirability and high manifest anxiety for the female sample. It seems that defensive individuals with a great need for self-esteem and social recognition tend consciously or unconsciously to deny their worries and fears because perceiving themselves as worried or fearful, is incompatible with their self-image. Since the male subjects were not given the M-C.S.D.S. we have no information about the relationship between manifest anxiety and social desirability. We predict that males

would demonstrate an even stronger correlation between the two tests, because to admit anxiety in our culture is perceived as more damaging to the ideal self-image of the male than of the female. This explains the common finding in many studies on anxiety that females score higher than males on manifest anxiety scales. This has also been found in our samples. The mean score of the females on the MAS is 16.4, whereas the mean of the males is only 11.2 and the difference is significant to the .01 level on a two-tail test.

5. Correlates of Social Desirability

We have already discussed the low negative relationships between social desirability and ambivalence scores and the similarly negative but somewhat stronger relationships between social desirability and hostility. We have also reported the positive correlations of this variable with physical risk and risk of prestige. The negative relationship between social desirability and manifest anxiety was given special consideration. An additional finding is the tendency of subjects with high scores on the Social Desirability Scale to report more affectionate and less punitive socialization practices of parents, but the significance criterion was met only by the correlation of $-.36$ between social desirability and general severity of parents.

E. Summary of Results of the Present Study

A battery of tests was administered to two college samples, males and females, in order to determine whether our major findings in the first stage of the research project could be replicated and to investigate more carefully possible sex differences in the patterns of relationships between variables.

The two samples, 35 males and 39 females, differed from the previous college sample in that they were undergraduate psychology majors and their participation in the experiments was not voluntary.

Several important changes were introduced in the testing procedures. All three risk tests were modified in order to make them more similar to one another and to real life situations.

Out of the series of perceptual tests which have been employed in the first stage of the project only the Witkin EFT and a part of the Smock AT were employed. Two additional tests were introduced to examine the nature of our technique for assessing ambivalence, tests of verbal fluency and of social desirability. Data analysis was conducted separately on each sample and the major techniques for statistical analysis were correlation coefficients and "t" tests.

A considerable part of our earlier findings were replicated in the present samples. Since the previously reported relationships were based on consistent results for three samples, the failure to duplicate some of them can be explained by the special nature of the new samples, by the changes in procedures and by real sex differences.

1. Replicated findings.

- a. Ambivalence was again demonstrated to be a generalized trait of conflicting attitudes toward parents, authority figures and siblings.
- b. Sexes do not appear to differ with respect to the intensity or generality of ambivalence.
- c. A high ambivalence conflict is associated with punitive socialization of parents.
- d. Ambivalence is positively related with anxiety tendencies as

measured by Taylor's MAS.

e. A certain degree of relationship is consistently demonstrated between ambivalence and the perceptual styles of rigidity and intolerance for ambiguity.

f. Ambivalence is a promising personality variable for the prediction of risk taking behavior. All 5 samples demonstrated a negative relationship between ambivalence and risk of prestige. Our findings on the different relationships of males and females between ambivalence and financial risk (positive for males and negative for females) may reflect real sex differences. A detailed analysis of the positive relationships between ambivalence and financial risk which were found for the college sample in our first study shows that it is the males who contributed most to this relationship. The correlations for the females were either zero or slightly negative. The inconsistency of findings concerning the connection between ambivalence and physical risk may be due to the nature of the test and the samples. More research is needed to draw definite conclusions about the relationships between ambivalence and financial or physical risk in both sexes.

g. Risk taking behavior was again correlated negatively with field dependence.

h. The negative correlations between anxiety and risk taking were demonstrated again for physical risk and risk of prestige but not for financial risk.

i. Physical risk was once more correlated positively with affectionate socialization practices for males but not for females.

j. The specificity of risk taking behavior was demonstrated to an even greater degree in our new samples than in the previous samples. Males seem to be more specific than females.

k. Field dependence which was studied only in the male sample of the present study indicated again a negative relationship with risk taking and anxiety. The male sample demonstrated several relationships for field dependence which were not found in the previous study. High field dependence in this sample was correlated positively with ambivalence, hostility, punitive socialization and intolerance of ambiguity. All correlations are in the predicted direction.

l. Intolerance of ambiguity, as measured by the number of responses in the Smock AT, correlated positively with ambivalence and punitive socialization. Strictly speaking, this finding is not a replication, because these two variables were not correlated in our previous study. However, since ambivalence was positively correlated with the index of intolerance of ambiguity in the Frenkel-Brunswick Cat-Dog Test, we are entitled to view the present finding as lending support to the hypothesized relationship between ambivalence and intolerance of ambiguity.

m. Anxiety was once more positively correlated with ambivalence, hostility, punitive socialization and intolerance of ambiguity. Also, the negative correlations with risk taking which were previously found were found again for physical risk and risk of prestige although not for financial risk. In this study, anxiety was also positively correlated with field dependence and with corporal punishment of parents, as opposed to psychological discipline. Females tended to have significantly higher anxiety scores than males.

n. Results of a measure of social desirability, which was introduced in the present study and given to the female sample, indicated negative correlations with ambivalence and hostility,

and positive correlations with physical risk and risk of prestige. A slight tendency was also shown for social desirability to be negatively related to subjects' self reports of punitive socialization. The strongest relationship for the Social Desirability Scale was its negative correlation with manifest anxiety scores.

2. Non-replicated findings.

- a. In our first studies we found a greater similarity between physical risk and risk of prestige than between these and financial risk. This enabled us to describe risk taking behavior as consisting of two separate clusters, one in which outcomes are determined by chance and payoff is connected with material gains and losses, and the other in which outcomes are determined by abilities and skills and payoff is connected with self-esteem, social recognition and feelings of well-being. In our present study, the distinction between the two patterns is less clear.
- b. The Rokeach Dogmatism Scale failed to show most of the relationships which have been found in the previous study.
- c. Even in those relationships in which the subjects in the present sample were similar to those in the previous study, they were less consistent and yielded, as a rule, smaller correlations. The most plausible explanation is that the greater sophistication of the subjects in testing and experimentation and their familiarity with the experimenters contaminated many of their response tendencies. A future analysis of data obtained from more naive subjects will enable us to draw a clearer picture of sex differences in the various areas of our research and especially in risk taking.

We conclude our summary with a tabular representation of our

major findings. Figure 2 presents the variables with which ambivalence is correlated and describes the direction of the correlations, Figure 3 does the same for risk taking, Figure 4 for anxiety and Figure 5 for perceptual styles.

Figure 2: Correlates of Ambivalence toward Parents — Siblings, Authority Figures and Self

Correlated Variables	Tests	Direction of Relationships	
		Males	Females
A. <u>PERSONALITY TRAITS</u>			
1. Generalized hostility	Ambivalence Test	Positive	Positive
2. High anxiety	Taylor MAS	"	"
3. High social desirability	M-C SDS	-	Slightly negative
B. <u>SOCIALIZATION OF PARENTS</u>			
1. High frequency of corporal punishment	Questionnaire	Positive	?
2. Low frequency of psychological discipline	"	"	?
3. High frequency of parental punishment	"	?	Positive
4. Low frequency of parental reward	"	?	"
C. <u>RISK TAKING</u>			
1. High risk of prestige	Situational test	Negative	Negative
2. High financial risk	" "	Positive	"
3. High physical risk	" "	Inconsistent	Inconsistent
D. <u>PERCEPTUAL STYLES</u>			
1. Intolerance of ambiguity	Smock's Amb. Task	Positive	-
2. " " "	Cat-Dog Test	-	Zero
3. Field dependence	Witkin EFT	Positive	-

Figure 3: Correlates of Risk-Taking Behavior

Type of Risk	Correlated Variables	Direction of Relationships	
		Males	Females
a. Financial risk	1. High risk of prestige	Slightly neg.	Positive
	2. High physical risk	Positive	"
	3. High ambivalence	"	Negative
	4. High hostility	"	"
	5. High parental reward	Zero	"
	6. High frequency of psych. discipline	"	"
	7. High field dependence	Negative	-
b. Risk of Prestige	1. High physical risk	Positive	Positive
	2. High ambivalence	Negative	Negative
	3. High hostility	"	"
	4. High anxiety	"	"
	5. High field dependence	"	-
	6. High social desirability	-	Positive
c. Physical risk	1. High anxiety	Negative	Negative
	2. High frequency of psych. discipline	Positive	Zero
	3. High frequency of parental reward	"	"
	4. High field dependence	Negative	-
	5. High social desirability	-	Positive

Figure 4: Correlates of Anxiety

Correlated Variables	Direction of Relationships	
	Males	Females
1. High ambivalence	Positive	Positive
2. High hostility	"	"
3. High frequency of psych. discipline	Negative	Negative
4. High frequency of corporal punishment	Positive	Positive
5. High frequency of parental reward	"	"
6. High frequency of parental punishment	"	"
7. High risk of prestige	Negative	Negative
8. High physical risk	"	"
9. High field dependence	Positive	-
10. High intolerance of ambiguity	"	-
11. High social desirability	-	Negative

Figure 5: Correlates of Perceptual Styles for Males

Type of Perceptual Style	Correlated Variables	Direction of Relationships
a. Intolerance of ambiguity	1. High ambivalence	Positive
	2. High frequency of corporal punishment	"
	3. High frequency of psych. discipline	Negative
	4. High frequency of parental punishment	Positive
	5. High frequency of parental reward	Negative
	6. High anxiety	Positive
	7. High field dependence	"
b. Field dependence	1. High ambivalence	Positive
	2. High parental reward	Negative
	3. High anxiety	Positive
	4. Low risk taking	"

III. PERCEPTUAL STYLES, AMBIVALENCE AND HOSTILITY

A. The Previous Study

In the first stage of the project we investigated the relationship between ambivalence and hostility toward significant social objects, and the perceptual styles of rigidity and intolerance for ambiguity.

Perceptual rigidity was measured by Witkin's (13) Embedded Figures Test (EFT) and by the Korchin and Basowitz's version of Frenkel-Brunswick's Cat-Dog Test (7). The Witkin EFT measures field dependence which is actually a form of perceptual rigidity. Field dependent individuals are rigidly bound to perceptual configurations and are not capable of a decomposition of its parts. The Cat-Dog Test measures the rigid fixation to an established perceptual set. The rigidity score is determined by a slow change of response set. This test is also employed for the study of intolerance for ambiguity. Two indices may serve this purpose: short latencies of response for the 3 middle pictures and a premature change of set.

We also used the Smock Ambiguity Task (12) for the measurement of intolerance of ambiguity. The author suggested the serial number of the card in a series to which the first response is given as an index for intolerance of ambiguity. We used instead the number of responses in a given series as the index of intolerance of ambiguity. The rationale for this modification was that it yields finer discriminations between degrees of intolerance of ambiguity. For instance, an individual, who gave his first response to the third card in a series and continued subsequently to respond to all the pictures which follow, is considered more intolerant of ambiguity than an individual who gave his first response to the same card but refrained from responding to the next 3 or 4 cards.

In the first stage of the project we failed to demonstrate a relationship between ambivalence and perceptual rigidity or field dependence. On the other hand, we found small but consistent correlations between ambivalence and intolerance of ambiguity as assessed by short latencies of responses to the middle pictures in the Cat-Dog Test. However, our second index of intolerance of ambiguity, the number of responses in the Smock Ambiguity Task was not correlated with ambivalence.

Our perception studies in the first stage of the project suffered from two methodological shortcomings. One shortcoming, specific to the Cat-Dog Test, was the lack of a proper control of the duration of presentation of pictures (they were not presented tachistoscopically). Another shortcoming, characteristic of all three perceptual tests, was the unsatisfactory analysis of the differences between male and female subjects. This shortcoming has been discussed in detail in a previous section of the report.

One objective of the perception studies in this stage of our project was to provide for a more detailed analysis of sex differences and to improve the procedures of test administrations. We have already reported in the previous section of the report the positive correlation between ambivalence and the perceptual styles of field dependence and intolerance of ambiguity in a sample of male college students. Here we will report on a study of the relationships between ambivalence and the perceptual styles of rigidity and intolerance of ambiguity for a sample of female college students. This was a part of a larger study in which a variety of perceptual styles and tendencies have been investigated.

B. The Problems of the Present Study

The study of the relationships between perception and personality may follow two lines of investigation. One possibility is to examine individual differences in the formal properties of perceptual functioning disregarding the stimulus content. Another possibility is to study the influence of certain

content areas on perceptual behavior. Both approaches have been employed in the study of perception. The main interest in our previous perceptual studies was to investigate the association between personality traits and formal aspects of perception such as rigidity, intolerance of ambiguity and field dependence. These problems were still the concern of our present study, but the major interest was focused on the style of perceptual variability which has a logical affinity to the cognitive and emotional variability of ambivalence. We attempted to examine perceptual variability in the context of certain content areas using the broad conceptual framework of response variability.

1. Response variability. Some attention was given to this topic in the first stage of the project under the heading of vacillation tendencies. The tendency to vacillate in situations where two or more courses of action are available was described as the essence of ambivalence and was postulated to be a generalized personality trait. This hypothesis was supported in our previous studies by consistent, although relatively small, correlations between ambivalence and vacillations in risk taking and in perception (10).

Response variability as a psychological phenomenon has been investigated in a large number of areas. A detailed review on this topic has been written by Fiske and Rice (3). Several studies reported some consistency in the degree of response variability, both across occasions and types of tasks. The evidence for or against the existence of a broad general trait of response variability is still inconclusive. A number of studies seem to indicate that personality integration and good adjustment are negatively correlated with response variability. In a recent study Worell (14) concludes that individuals with internal conflicts tend to carry over the disposition of alternation and variability to non-conflict situations, especially when both are contiguous in time.

This brief review of response variability focuses on studies in several areas, such as learning situations, psychomotoric tasks and psychometric responses, but not on perceptual behavior. We will turn now to this area.

Fiske and Rice make a distinction between response variability in changing stimulus situations and in identical situations. This distinction is especially pertinent to perception. The first type of response variability in perception has been investigated in the context of perceptual rigidity. Variability of perception in changing situations is, obviously, seen as more adaptive than a rigid consistency.

2. Perceptual variability. Less systematic work has been carried out on perceptual variability in a single situation or in two identical situations which are separated by a time interval. An interesting possibility for the investigation of perceptual variability is binocular rivalry. It constitutes a single situation in the time dimension, but two different situations from the point of view of stimulus content. In binocular rivalry the information which is supplied to the visual center of the brain may not only be different but incompatible. The differences between the two monocular stimuli may pertain to structure, as determined by their physical properties, or to content, as determined by their social and intellectual meaning.

Structural binocular rivalry has a relatively long tradition of investigation. A variety of perceptual responses have been reported: alternations of monocular fields, the dominance of one field, the simultaneous perception of both fields, and the fusion of both fields into a single configuration. Alternations and dominance responses were found to be more common than fusion or simultaneous perception of both fields, and most of these studies focused on the conditions determining the rate of alternation and the relative or absolute dominance of one of the fields. Relative dominance of one field over another was found to be controlled by the same variables which effect the efficiency of visual perception in general: light intensity, color saturation, clearness, movingness etc. Decreasing the discrepancy between both fields results in less relative dominance of one field and the typical binocular resolution under these conditions is a more or less rhythmical alternation (2, 4, 6).

The rate of alternation, however, was found to be determined not only by the physical properties of the stimuli, but also by the physical or mental states of the perceiver. Depressants or tranquilizers, for instance, tend to decrease the rate of alternation, whereas stimulants tend to increase it. Of special interest for the present study is the consistent finding that the rate of alternation is significantly smaller in cases of mental disorders in comparison to the rate of normal individuals (5). This finding seems to contradict the previously reported findings about a positive relationship between conflict or maladjustment and a high rate of response variability (3, 14).

The investigation of the binocular resolution for two stimuli varying in the amount of difference in meaning, was first introduced by Engel (2). This instigated a series of studies with complex stimuli such as photographs, real faces, and various pictures. The typical perceptions reported were either the dominance of one stimulus or a composite of both. The common objective of these studies was to point to cognitive and motivational determinants of perception, such as familiarity and social preference (6). Conditions yielding alternation responses and their relationship to personality by utilizing binocular rivalry with stimuli of different or competing contents have not been investigated. These problems were the concern of the present study.

C. Methods and Procedures

Two samples were employed in the perceptual study, a female sample and a male sample.

1. The Female Sample

The sample of 34 female college students (described in the first part of our report) was administered a binocular rivalry test and the Cat-Dog Test.

a. The binocular rivalry test. The stimuli consisted of photographic transparencies of Hebrew words (designed to minimize contour-interaction) and of various drawings. Each pair of verbal stimuli consists of two antonyms (e.g., love-hate) and each pair of pictorial stimuli consisted of two pictures which represented opposing contents. Words or pictures in a pair were carefully chosen, as to be fairly similar in their structural properties. Since our major purpose was to investigate the relationship between binocular resolution and ambivalence, the content of the stimuli was chosen from areas which are pertinent to the origin and nature of ambivalence. There were altogether 17 pairs of stimuli, 9 verbal and 8 pictorial representing four content areas: (1) masculinity-femininity, (2) activity-passivity, (3) aggression-affection and (4) indulgence-punitiveness of socialization. The pairs of stimuli are given in Figure 6.

Since instructions or an established set may influence the rate of alternation, we introduced 8 pairs of buffer stimuli, 3 pictorial and 5 verbal which were distributed in the experimental series. Stimuli were identical in seven buffer pairs (e.g., Flower-Flower) and different but of neutral and unrelated contents in one pair (Oak-Cat).

b. Apparatus. An Iconix FAST system: (Model 6080, Transducer Power and Control Unit; Model 6010, Preset Controllers; and Model 6255 Time Interval Generator/Counter), provided exact control of duration of the pulses of two Sylvania R 1131C Glow Modulator tubes. Each tube was mounted on a Leitz Pradovit n12 automatic slide projector. Light emitted from each projector was polarized by a Polaroid filter, the two planes of polarization being orthogonal. Light intensity was controlled by insertion of Ilford neutral density filters in the paths of the beams. The two beams were projected on a plate of frosted glass forming rectangular fields of 25×15 cm.

Figure 6. Pairs of Stimuli in the Binocular Rivalry Test:¹

Verbal

Pictorial

a. Masculinity - Feminity

1. Man - Woman

1. Young man - Young woman

2. Bearded man - Woman*

3. Missile - Ship*

b. Activity - Passivity

2. Active - Passive

4. Airplane - Sail-boat

c. Aggression - Affection

3. Hates - Loves

5. Weeping face - Laughing face*

4. Tortures - Satisfies*

6. Angry face - Pleasant face

5. Bite - Kiss

6. Strangles - Embraces

7. Alone - Together*

d. Punitive socialization - Indulgent socialization

8. Punishment - Reward*

7. Man beating boy - Man patting boy

9. Abandoned - Loved*

8. Woman rejecting girl - Woman drawing girl near*

1. It should be noted that the verbal pairs of stimuli consisted of the Hebrew equivalents of the words. They were chosen for their content as well as for their structural similarity

* These pairs were not included in the study of the male sample. The verbal series for the males contained two pairs of words which were not given to the female sample. These were Father - Mother in the masculinity-femininity content area, and Strong - Weak in the activity-passivity content area.

Since instructions or an established set may influence the rate of alternation, we introduced 8 pairs of buffer stimuli, 3 pictorial and 5 verbal which were distributed in the experimental series. Stimuli were identical in 7 buffer pairs (e.g. Flower - Flower) and different but of neutral and unrelated contents in one pair (Oak - Cat).

b. Apparatus. An Iconix FAST system:(Model 6080, Transducer Power and Control Unit; Model 6010, Preset Controllers; and Model 6255 Time Interval Generator/Counter), provided exact control of duration of the pulses of two Sylvania R1131C Glow.

The fields were made to coincide on the viewing screen by means of a half-silvered mirror. The subject observed the screen through a pair of crossed polaroids affording her a view of one projected field respectively to each eye. The luminance of the field was measured (without a slide in the projector) with an Ilford SEI Exposure Photometer through both sets of polaroids, yielding 5 ft. -L to each eye. The apparatus was screened from the view of the subject who sat in the dark during the experiment. Two buzzers were attached to the table in front of the subject, one on her right and the other on her left, both within easy reach. Each buzzer was connected to an electric synchronous motor stop clock, which was started by pressing the button and was stopped by releasing it. Duration could be read off the timer with an accuracy of .01 sec.

c. Procedure. Each session lasted one hour. The subject dark-adapted for 5 minutes before the experiment began. She was seated facing the screen, her chin resting on a chin-rest to which the polarizing filters were attached. The distance between the viewing screen and the subject's eye was 115 cm. The experiment consisted of three parts: determination of threshold, short exposures of the series of paired stimuli and long exposures of the same series in a different order.

(1). Determination of recognition-threshold. One of the two experimenters gave the following instructions to the subject:

"This is an experiment in perception, investigating the threshold of vision for both eyes together. There are four parts to this experiment. I will now read you the instructions to the first part. On the screen before you a picture will appear for a short period of time. Before the picture is projected we will say "ready", so that you will concentrate your attention on what appears on the screen. You are to report whatever you saw."

A pair of stimuli, identical drawings of a horse, were then projected in an ascending series of durations (Steps of .1 sec.), beginning from .1 sec. until the picture was identified correctly.

(2). Short exposures. After the recognition threshold was established, the experimenter gave the following instructions:

" We are now beginning the second part of the experiment. In this part we will present a number of different pictures or words; they too, will appear briefly. When we say "ready", you are to look straight at the screen, keeping both eyes open, and without moving your eyes or head to the right or the left. Try to blink as rarely as possible. If you feel that you must close an eye, close both eyes, and open them together, so as to tire both eyes equally.

If what appears on the screen is a word, tell us which word it is. You might not be able to make sense out of the word, don't worry — if you can't read it as a meaningful word, spell it out. If you see a picture, tell us what it means to you. If you see people in the picture, tell us what they are doing, what is the expression on their faces."

The entire series of the experimental pairs of stimuli was then presented twice in a row in different orders, with buffer pairs interpolated on the average, every fourth pair. The presentation duration was .3 sec. longer than the S's recognition threshold. Stimuli presented to the right eye in the first series were presented to the left eye in the second series and vice versa. This was done in order to trace and discard subjects with a high eye dominance.

(3). Long exposures. The instructions to this part were as follows:

" In this part the words or pictures, which we will present will remain on the screen somewhat longer. It is very important that you should keep

both eyes open and direct your gaze to the screen. Do not move your head or your eyes. If you must blink, close and open both eyes together. On the table you will find one button to your right and another to your left. The moment the word or picture appears, say what you see, and, at the same time, press the right-hand button. A change may occur in what you see. You will in such a case release the right-hand button and press the left-hand one. If another change occurs, release the left-hand button and return to pressing the right-hand one. If the word or picture is not clear or is meaningless, or if you see two different things at the same time, do not press the buttons. If this happens after you saw a single and clear word or picture, release the button which you were pressing and report the two things or words or the single meaningless word or picture without pressing a button."

After the instructions the entire series of stimulus pairs was presented once in random order, each pair being exposed for 30 seconds. The timer gave a measure of the cumulated durations of the periods of dominance of one of the component stimuli, while a measure of the periods of simultaneous perception or distorted fusion was obtained by subtracting the duration of dominance from the total presentation time. The number of alternations was recorded by one of the experimenters during the exposure.

d. The intolerance of ambiguity test. After the completion of the binocular rivalry test, S was allowed to rest for a few minutes and was then instructed as follows:

"You will now see pictures of dogs or cats on the screen. After a picture is shown, tell us which it resembles more, a dog or a cat. There are no right or wrong answers, different persons see these pictures differently. If a picture looks like both animals, decide which animal it resembles most."

The 13 pictures were exposed tachistoscopically after the instructions. The series began with an articulate picture of a dog, gradually assuming the characteristics of a cat in the subsequent pictures. The most ambiguous pictures are numbers 6, 7 and 8 in the series. Picture number 9 is a fairly articulate drawing of a cat.

Each of the 13 pictures was presented until S gave a response, the order remaining fixed throughout. The experimenter recorded the response and reaction time for each picture.

2. The male sample.

Nineteen soldiers, drawn from a larger sample used in an extensive investigation of ambivalence and risk taking, were given the binocular rivalry test. The apparatus consisted of a modified Brewster stereoscope adapted to hold 3.5×2.5 cm. slides. Illumination was provided by a 2 w. bulb, powered by 6.3 V transformer and turned on and off by means of an external switch. A pair of stimuli consisting of a circle and a cross were presented to S. The experimenter moved the carriage back and forth until the subject reported that the cross was centered in the circle. All other stimuli were presented at this distance.

The series of the experimental pairs of stimuli (7 verbal and 4 pictorial) with interpolated buffer pairs were presented twice in a row in different random orders, so that each stimulus of a pair was exposed once to the right eye and once to the left eye. Exposure duration for each pair was .8 sec.

The long exposure procedures were similar to those employed with the female sample. The scoring method was also similar, the only difference being that the category of socialization was combined together with the aggression-affection category.

3. Scoring procedures for the binocular rivalry test.

The binocular rivalry test was scored for two types of variables:

(1) perceptual styles and (2) content sensitivities.

a. Perceptual styles. We obtained from the content categories 4 scores of distinct perceptual styles: (1) alternations, (2) simultaneity, (3) dominance and (4) distorted fusion. An alternation score for a given content category consisted of the number of alternations in all pairs of the given category during the long exposures. The algebraic sum of the scores in all categories constituted the score of overall alternations. The short exposures did not contribute to this score because the presentation duration was too short for the occurrence of alternations. The three remaining scores were based on both, short and long exposures. The score of simultaneity consisted of the proportion of time in which both stimuli in a pair were perceived simultaneously. The distorted fusion score on the other hand, consisted of the proportion of the total time in which a meaningless composition of both stimuli in a pair was reported (the rare cases of perceptions of a single but meaningful composition were discarded). The dominance score represented the proportion of time in which one stimulus in a pair was consistently perceived in all exposures.

For data analysis of alternations separate scores for each category, as well as the total score across content categories were utilized, but for simultaneity, distortion and dominance only the total scores were analysed.

We also derived a "repression" score for each content category and for the total series for the short and long exposures separately. This score consisted of the algebraic sum of the 4 scores of perceptual styles with differential weights assigned to them according to their distance or proximity to the type of behavior which could be interpreted as perceptual defensiveness or repression. Consequently, dominance response were given the highest weight, responses of simultaneity the lowest weight and alternations and distortions a middle weight.

b. Content sensitivity. The relative perceptual dominance for one of the items in a stimulus pair was determined for each subject and represented by a numerical score. Scores for single pairs were then combined into "sensitivity" scores for an entire content category. We obtained by this procedure scores of perceptual sensitivity for masculinity, aggressiveness, punitive socialization and activity. A high sensitivity score for masculinity indicated greater perceptual dominance for the masculine items, whereas a low sensitivity score for masculinity indicated greater perceptual dominance for feminine items in the masculinity-femininity category. The same scoring procedure was employed for the remaining categories.

Data analysis for the female sample was carried out on the separate scores of each stimulus pair as well as with combined scores for each of the four content areas. For the data analysis of the male sample, only the latter scores were used.

4. Scoring procedures for the Cat-Dog Test

For the female sample, data of perceptual rigidity and intolerance of ambiguity were obtained from the Cat-Dog Test. Rigidity was indicated by a delayed change of set after the presentation of the middle pictures. Intolerance of ambiguity was derived from three indices: (1) short latencies for the middle pictures, (2) short total reaction time and (3) a premature change of set (a change before the middle pictures). Perceptual variability was indicated by the number of vacillations between the two response tendencies.

D. Results

1. Results for the male sample

Of the 19 subject one was discarded, because 80 % of his responses clearly indicated eye dominance. The remaining 18 subjects gave the following results:

a. The consistency of perceptual styles was examined by correlating the scores of alternations for each of the three categories, masculinity, activity and aggressiveness. The results are given in the following table.

Table 16: Correlations between Alternation Scores in the Three Content Areas for the Male Sample¹:

	1	2	3	4
1. Masculinity-Femininity		.11	.66*	.84*
2. Activity-Passivity			.51*	.51*
3. Aggressiveness-Affection				.95*
4. Total				

1. Asterisks denote correlations of p. values $< .05$ on a two-tail test.

The table shows clearly the existence of a general tendency of perceptual variability. Strangely enough, the alternation tendency in the masculinity-femininity category has only a negligible correlation with the corresponding tendency in the activity-passivity category.

b. Alternation scores were positively correlated with high perceptual sensitivity for masculinity and aggressiveness items but negatively with sensitivity for activity items. This is shown in the following table:

Table 17: Correlations between Alternations and the Dimensions of Perceptual Sensitivity for the Male Sample¹:

Areas of Alternation	Content of Perceptual Sensitivity		
	Masculinity	Aggressiveness	Activity
1. Masculinity-Femininity	.49*	.00	-.30
2. Aggressiveness-Affection	.54*	.17	-.41
3. Activity-Passivity	.14	.41	-.32
4. Total	.49*	.17	-.41

1. Asterisks denote correlations of p. values $< .05$ on a two-tail test.

c. All alternation scores correlated positively with ambivalence and to some degree with hostility, as is shown in the two tables below:

Table 18: Correlations between Perceptual Alternations and Ambivalence Scores for the Male Sample¹:

Areas of alternation	Ambivalence scores				
	Father	Mother	Self	Commander	Total
1. Masculinity-Femininity	.13	.31	.25	-.16	.00
2. Activity-Passivity	.14	.60*	.27	.20	.33
3. Aggressiveness-Affection	.37	.75*	.38	.17	.43
4. Total	.28	.67*	.37	.00	.30

1. Asterisks denote correlations of p. values $< .05$ on a two tail test.

Table 19: Correlations between Perceptual Alternations and Hostility Scores for the Male Sample:

Areas of alteration	Hostility Scores			
	<u>Father</u>	<u>Mother</u>	<u>Self</u>	<u>Commander</u>
1. Masculinity - Feminity	.10	.00	.35	-.22
2. Activity - Passivity	.21	.14	.00	.12
3. Aggressiveness - Affection	.27	.22	.00	.00
4. Total	.24	.19	.21	-.11

d. Negative correlations were found between ambivalence and the perceptual styles of dominance and simultaneity. This is shown in the following table:

Table 20: Correlations between Ambivalence and the Perceptual Styles of Dominance and Simultaneity for the Male Sample¹

Perceptual styles	<u>Ambivalence</u>				Total
	Father	Mother	Self	Commander	
1. Dominance	.00	-.22	-.63*	-.23	.00
2. Simultaneity	-.23	-.34	-.16	-.28	-.35

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

e. No consistent relationship was found between ambivalence with the style of distorted fusion.

f. A trend of a negative relationship was found between scores of perceptual sensitivity for items of activity in the binocular test and scores of hostility toward self and others. The same was true to some degree also for ambivalence. The correlations are given below.

Table 21: Correlations between Sensitivity to Activity Items and Ambivalence and Hostility Scores in the Male Sample¹

	Father	Mother	Self	Commander
1. Hostility	-.60*	-.59*	-.55*	-.39
2. Ambivalence	-.00	-.42	-.30	-.12

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

g. A significant correlation was found between sensitivity for masculinity items and ambivalence toward self (.49). A somewhat smaller correlation (.42) was obtained between this perceptual sensitivity and ambivalence toward mother. No correlation, on the other hand, was obtained for ambivalence toward father or commander. The relative overall sensitivity for items of aggressiveness did not correlate with ambivalence or hostility scores.

h. The only consistent and sizeable correlations between the weighted "repression" scores and ambivalence were obtained for ambivalence toward self. Out of 9 correlations only one was zero and the rest ranged from -.32 to -.53. The strongest relationship was obtained for the combined score of "repression" across both areas and exposures. Most of the correlations between "repression" scores and all other ambivalence or hostility scores were also negative but small; a few of them were in the opposite direction.

2. Results for the female sample

The results for the female sample include data from the binocular rivalry test and the Cat-Dog Test.

a. Results for binocular rivalry. More extensive data analyses were carried out on the female sample than on the male sample. Out of the 34 Ss 5 were discarded because of strong eye dominance. The results for the remaining 29 subjects are:

(1). Like the male sample, the female sample also indicated consistency in the style of perceptual variability. However, the pattern of correlations between alternations in the various content areas is different, because the stimulus pairs were more numerous for the female sample and they were classified into five categories instead of three. The correlations are given in the table below:

Table 22: Correlations between Alternations in the Various Content Categories for the Female Sample^a:

	1	2	3	4	5	6
1. Masculinity - Femininity		.00	.71*	.35	.43*	.75*
2. Aggressiveness - Affection			.25	.00	.48*	.42*
3. Punitive socialization - Indulgence				.17	.50*	.80*
4. Activity - Passivity					.46*	.44*
5. Affiliation - Loneliness ^b						.65*
6. Total alternations						

(a). Asterisks denote correlations with p. values < .05 on a two tail test.

(b). See footnote at beginning of next page.

(b). This category consisted of one stimulus pair — the antonyms Alone-Together. It was classified and analyzed as a separate category because its content did not fit too well in any of the four categories. As a rule, a score based on a single item is less reliable and yields smaller correlations than a score based on several items. This, however, was not true for the item Alone-Together. The scores of perceptual styles and perceptual sensitivity which were derived from it yielded significant correlations which were frequently higher than the correlations for the corresponding scores of the other content categories.

(3) The relationships between alternation tendencies and the contents of perceptual sensitivity (the direction of perceptual dominance) were positive for masculinity and aggressiveness items and negative for activity items in the male sample. These relationships were different and smaller in the female sample, as can be seen in table 23.

Table 23: Correlations between Alternations and Content Dimensions of Perceptual Sensitivity for the Female Sample¹

Content areas of alternations	Contents of perpetual sensitivity				
	masculinity	aggres- siveness	punitive socialization	activity	loner- liness
1. Masculinity - femininity	-.24	.00	.00	.17	.00
2. Aggressiveness - affection	.00	.00	-.10	.00	.43*
3. Punitive socialization - indulgence	-.17	.00	.14	.00	.10
4. Activity - passivity	-.46*	-.15	-.29	.35	.00
5. Loneliness - affiliation	-.19	.00	.00	.00	.33
6. Total alternations	-.27	-.15	.00	.10	.15

Males who were more sensitive (indicated a relatively greater perceptual dominance) for items with a masculine connotation tended to have a higher rate of alternation in all categories than males with a greater sensitivity for femininity items. The female sample demonstrated a reversed relationship. The same sex difference was also true for greater perceptual sensitivity to activity items (rather than to passivity items). However, the correlations for the female sample are smaller than for the male sample in both cases. Males with greater perceptual sensitivity to items of aggressiveness or punitive socialization tended to alternate more in most items of the binocular test than males with greater sensitivity to affection items or items of parental indulgence. The females did not show a clear trend of relationships between their sensitivity in these categories and alternations. On the other hand, sensitivity of females to the word Alone (rather than Together) was positively correlated with alternations.

If it is permitted to view perceptual sensitivity to certain contents in binocular rivalry as an assessment of personality traits which correspond to these contents, then we may interpret our finding as follows: good adjustment in sexual identity is connected with a greater rate of alternations in binocular rivalry.

(4). The differences between both samples is especially pronounced in the trend of relationships between ambivalence and perceptual alternations. The direction of the correlations between these variables for males is positive, but it is negative for females and of a smaller size. This is shown in table 24.

Out of the 36 correlations of the table, 22 are negative and 3 are significant (the few positive correlations are very small with the exception of the correlation of .39 between alternations in the activity-passivity category and ambivalence toward self). The high proportion of negative

correlations seems to point to a meaningful relationship which indicates an important difference between males and females. It seems that, in contrast to males, the females demonstrate a tendency of "compensation" in response variability across perceptual areas. Females with higher vacillations in the ambivalence test tend to have a smaller rate of alternations in binocular resolutions and vice versa. As it will be seen later, the same compensation phenomenon appears when we compare the binocular test with the Cat-Dog Test.

Table 24: Correlations between Perceptual Alternations and Ambivalence Scores for the Female Sample¹

Areas of alternation	Ambivalence scores					
	Father	Mother	Brother	Sister	Self	Total
1. Masculinity - femininity	-.16	-.16	-.29	-.30	-.28	-.37*
2. Aggressiveness - Affection	.00	-.12	.22	.11	-.16	.00
3. Activity - Passivity	.12	.10	.00	-.20	.39*	.00
4. Punitiveness-Indulgence	.00	-.23	-.34	-.32	-.18	-.39*
5. Affiliation - Loneliness	.00	-.15	-.20	-.14	.00	-.15
6. Total alternations	-.14	-.21	-.30	-.35	.00	-.36*

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

(5). The correlations between perceptual alternations and hostility scores for females are also negative but smaller than with ambivalence:

Table 25: Correlations between Perceptual Alternation and Hostility for the Female Sample¹

Areas of alternation	Hostility scores					
	Father	Mother	Brother	Sister	Self	Total
1. Masculinity - Femininity	-.14	.00	.00	-.31	-.40*	.00
2. Aggressiveness - Affection	-.14	-.22	.00	.18	-.21	.00
3. Activity - Passivity	.00	.00	-.19	.00	.00	.00
4. Punitiveness - Indulgence	-.12	-.21	-.22	-.26	-.28	-.12
5. Affiliation - Loneliness	-.26	-.26	-.15	-.15	-.17	-.24
6. Total alternations	-.23	-.25	-.30	-.22	-.40*	-.21

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

Out of 36 correlations, 25 are negative and two are significant. This negative trend of relation between alternations in the binocular resolutions and hostility could be explained by the somewhat greater tendency of hostile subjects to be more sensitive to items with hostile content. Evidence for this is to be found in the correlations of .33 and .39 between the high sensitivity to the hostile items in the aggressiveness-affection category and scores of hostility toward father and mother respectively. However, this explanation is not relevant to the categories of masculinity-femininity and loneliness-affiliation for which a similar (and even stronger) relationship with alternations was demonstrated. Obviously, an additional factor common to ambivalence and hostility is contributing to the negative correlations between these attitudes and alternations in the binocular resolutions. These will be discussed in detail in a later section.

(6). The females show a trend of positive relationships between ambivalence and the perceptual style of dominance (for a single item in a pair), whereas males show a negative relationship. This is not surprising, since high scores on alternation are necessarily accompanied by low scores on dominance.

The only results common to both samples are the negative correlations between ambivalence and the perceptual style of simultaneity. Both samples failed to show a consistent relationship between ambivalence and the perceptual style of distorted fusion.

The correlations between ambivalence and the 4 perceptual styles of the female sample are given in table 26.

Table 26: Correlations between Ambivalence and the Perceptual Styles of Simultaneity, Dominance and Distortion for the Female Sample¹

Perpetual Styles	Father	Ambivalence scores				
		Mother	Brother	Sister	Self	Total
1. Simultaneity	-.41*	-.10	-.30	-.23	.00	-.25
2. Dominance	.21	.00	.11	.34	.00	.22
3. Distortion	.00	.17	.18	-.16	.26	.14
4. Alternations	-.14	-.21	-.30	-.35	.00	-.36*

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

We may summarize by saying that both males and females show negative relationships between ambivalence and the style of simultaneity, but the samples differ in the relationships between ambivalence and the alternation and dominance styles. In the male sample the correlations between ambivalence and alternations are positive and for the female sample they are negative. The correlations between ambivalence and dominance are negative for males and positive for females.

(7). The male sample demonstrated a negative relationship between the tendency to perceive the activity items rather than the passivity items. in the activity-passivity category and the ambivalence and hostility scores. Females showed a reversed trend. A similar pattern of relationships (with the exception of ambivalence toward self) was also found for the females between ambivalence and hostility scores and the perceptual dominance for items of aggressiveness. Males did not show any relationship at all. The female sample also differed from the male sample in that a slight negative rather than a positive relationship was found between dominance for masculinity items and ambivalence. A noteworthy finding was the consistently negative trend of correlations between ambivalence of females and the perceptual dominance of the item "Alone" in the stimulus pair Alone-Together. The results are reported in detail in the following table:

Table 27: Correlations between Ambivalence and Hostility Scores and Scores of Perceptual Sensitivity in Various Content Areas for the Female Sample¹

Content of perpetual sensitivity	Score	<u>Figures of ambivalence and hostility</u>					Total
		Father	Mother	Brother	Sister	Self	
1. Activity	amb.	.00	.33	.33	.00	.45*	.32
	host.	-.21	.00	.21	.00	.00	.12
2. Aggressiveness	amb.	.44*	.00	.00	.35	-.26	.00
	host.	.33	.39*	.00	.00	-.13	.19
3. Loneliness	amb.	.36	.11	.18	.37*	.12	.35
	host.	.00	.10	.25	.24	.11	.00
4. Masculinity	amb.	.00	-.13	-.10	.00	-.36	-.16
	host.	.00	.00	.00	.20	-.14	.00

1. Asterisks denote correlations with p. values $< .05$ on a two tail test.

No consistent relationship was obtained for the females between ambivalence or hostility and their perceptual sensitivity to the punitive items in the category of punitive vs. indulgent socialization. However, the perceptual sensitivity to the word "Abandoned" over the word "Beloved" (this pair was a part of the socialization category) did show a fairly consistent trend of small but negative correlations with ambivalence.

(8). The general trend of relationships between ambivalence and the various scores of "repression" is positive but not strong and not entirely consistent. The correlations of overall "repression" and ambivalence toward father, mother, brother, sister and self are .26, .00, .25, and .20 respectively. The most impressive correlation was obtained for the tendency of "repression" in the masculinity-femininity category and ambivalence toward self ($r = .56$). The same pattern of correlations was also found between "repression" scores and hostility. The highest correlations were obtained for hostility toward self (the correlation between the score of total "repression" and hostility toward self was .54).

We will now summarize the findings on binocular rivalry for both samples:

Figure 7: A comparison between Findings for the Male and Female Samples:

Perceptual Variables - Correlates			Trend of relationship	
			Males	Females
1.	Perceptual alternations -	Ambivalence	positive	negative
	"	" - Hostility	"	"
	"	" - Masculinity	"	"
	"	" - Aggressiveness	"	"
	"	" - Activity	negative	positive
	"	" - Loneliness	-	"
2.	Perceptual simultaneity -	Ambivalence	negative	negative
3.	" dominance -	Ambivalence	"	positive
4.	" distortion -	"	zero	zero
5.	" repression -	"	negative	positive
6.	"	" - Hostility	"	"
7.	Masculinity -	Ambivalence	positive	negative
8.	Aggressiveness -	Ambivalence	zero	positive
9.	Activity -	Ambivalence	negative	positive
10.	Loneliness -	"	-	"

b. Results of intolerance of ambiguity. The improvement of administration procedures as compared with our study in the first stage of the project did not result in substantial changes in the findings for perceptual rigidity, intolerance of ambiguity and vacillations.

(1). We failed once again to demonstrate the expected relationship between ambivalence and rigidity as measured by the delayed change of set.

(2). The positive relationship between intolerance of ambiguity and ambivalence found in the first stage of the project was not replicated in the female sample. Intolerance of ambiguity, as indicated by short latencies for the middle pictures of the Cat-Dog test, yielded small negative correlations with ambivalence. The second index of intolerance of ambiguity, the premature change of set, also failed to show a consistent relationship with ambivalence.

(3). Vacillations on the Cat-Dog Test, on the other hand, were again positively correlated with ambivalence and hostility. This is shown in the table below:

Table 28: Correlations between Vacillations on the Cat-Dog Test and Scores of Ambivalence and Hostility for the Female Sample¹

	Father	Mother	Brother	Sister	Self	Total
1. Ambivalence	.26	.29	.32	.00	.00	.28
2. Hostility	.20	.13	.37*	.00	.00	.19

1. An asterisk denotes a correlation with a p. value $< .05$ on a two tail test.

An ambivalence score consists of vacillation components, and of components of defensiveness. The small positive relationships between vacillations in the Cat-Dog Test and ambivalence scores are due to the

positive correlations between the former and the vacillation components of the ambivalence scores. These correlations are considerably higher than the correlations with the composite ambivalence scores. This finding which was demonstrated in both stages of the project indicates the presence of generalized tendency of response variability.

(4). The "compensation" phenomenon which was found for alternations in binocular rivalry and ambivalence of the females seems to operate also for vacillations on the Cat-Dog Test. The vacillation scores in the Cat-Dog Test are correlated negatively (or zero) with alternations in binocular resolutions. The correlations are presented in Table 29:

Table 29: Correlations between the Vacillations of both Perceptual Tests for the Female Sample

	<u>Alterations in binocular rivalry:</u>				
	masculinity- femininity	aggressiveness affection	activity passivity	loneliness affiliation	Total
Vacillations in the Cat-Dog Test	.00	-.24	.00	-.38	-.24

(5). Vacillations in the Cat-Dog Test yielded a slight negative correlation of -.14 with perceptual simultaneity in binocular rivalry, but positive correlations of .41 and .56 with "repression" and distorted fusion, respectively.

(6). Correlations between the scores of delayed change of set and the "repression" scores in binocular rivalry were negative. The largest correlation ($r = -.37$) was obtained with "repression" in the aggressiveness-affection category.

(7). High reaction time for all cards of the Cat-Dog Test — which we suggested as an index of low intolerance of ambiguity — showed small positive rather than negative correlations with ambivalence and somewhat larger correlations with hostility ($r = .35$ with overall hostility). The

correlations of this score with "repression" scores in binocular rivalry were negative, especially for the short exposures ($r = -.31$). A positive correlation of .33 was obtained between total reaction time for the Cat-Dog Test and the style of perceptual simultaneity on the binocular rivalry test. Since common sense and obtained relationships justify to view the style of simultaneity as an index of perceptual efficiency and personal adjustment, the correlations of these variables with large reaction times for the Cat-Dog Test enable us to interpret the latter as an index of perceptual flexibility, in spite of the fact that it doesn't show the expected relationships with ambivalence scores.

(8). Summary. Oscillations on the Cat-Dog Test show positive correlations with ambivalence and hostility scores and with the perceptual styles of "repression" and distorted fusion but negative correlations with alternations in binocular rivalry. High total reaction time in the Cat-Dog Test is positively correlated with the perceptual style of simultaneity and negatively with repression in binocular resolutions.

E. Discussion

The main objectives of the present study were to examine the interrelationships among several perceptual styles, to investigate their connection with ambivalence and hostility toward self and others, and to examine possible sex differences.

Perceptual styles such as rigidity, intolerance of ambiguity, field dependence, or variability have in general been investigated as formal modes of cognitive functioning, with the assumption that these modes are relatively independent of the meanings and contents of specific situations. On the other hand, certain areas of research in perception, such as perceptual defence, went to the other extreme by concentrating on the psychodynamic impact of certain content areas on perceptual behaviour, without a systematic conceptualization of the formal properties of the perceptual modes in question.

The shortcomings of the former approach lie in the assumption of the broad generality of perceptual modes which have been proven repeatedly to be unwarranted in replication studies in which the stimulus situations were changed. The shortcomings of the latter approach rest in its narrow specificity which does not allow the experimenter to utilize findings for the understanding of perception in general.

At the outset we followed the formal approach and investigated the mutual relationships and correlates of rigidity, intolerance of ambiguity, field dependence and oscillations utilizing tools having a neutral content. We failed in those studies to demonstrate stable relationships between the perceptual styles and personality characteristics, or even between separate indices for a given perceptual style. The only stable finding in our studies seems to be the small positive, correlation between perceptual oscillations (in the Cat-Dog Test) and ambivalence.

In the present study we introduced a new tool — a binocular rivalry test, a technique in which both approaches to the investigation of perception can be combined. The binocular rivalry test has been employed in a great number of studies to investigate two perceptual styles: alternations between stimuli and the perceptual dominance of a single stimulus. But, as we have pointed out, two additional styles of perception are demonstrable by this technique — the simultaneous perception of both stimuli and their distorted fusion. These two modes of perception have been observed, of course, in previous studies but were largely ignored by most investigators. A more crucial innovation in the present study was the introduction of stimulus-pairs of incompatible contents. These contents represented psychodynamic conflict areas (such as hate vs. love, aggression vs. affection, masculinity vs. femininity etc.), about which a great deal of information is available in the literature. Such a procedure seemed to us as most promising for our

research, which is concerned with decision making behavior in conflict situations. The investigation of risk taking behavior deals with decisions in conflict situations, in which alternative courses of action are consciously known and decisions are voluntarily made. A binocular rivalry test is similar to a risk taking situation in that choices between alternative responses are required. It differs from risk taking or many other decision making tasks in one important respect. The individual may not be aware of the existence of alternatives and his choice is therefore involuntary and unconscious. This is true even when the individual knows that different stimuli are presented to each eye. When his perception at a given moment consists of only a single stimulus, he is actually in a situation where no choices can be made. Nevertheless, decision making is involved in binocular resolutions, since alternatives are presented and choices between them are made, although on an unconscious level. This was demonstrated in our finding that individuals with certain personality characteristics, such as high or low ambivalence, tend to be unconsciously selective in perceiving one item in a pair more frequently than the other item. Obviously, some registration of both stimuli must take place before a selective choice is made, but both registration and selection remain unconscious. The very fact that two incompatible stimuli are processed at the same time creates conflict and discomfort which is probably enhanced if the contents of the stimuli correspond to an already existing internal conflict. The preference of one of the stimuli for perceptual awareness and the continuous or temporary inhibition of the other stimulus are determined by several factors, such as familiarity, likes and dislikes, and anxiety. Individuals with more conflicts and greater anxiety will more frequently inhibit one of the stimuli, mostly the anxiety provoking one, and thus avoid the discomfort of conflict and the arousal of anxiety.

The situation presented to individuals in our ambivalence test is a composite of conscious and unconscious choices between positive and negative evaluations of the self and of others. In this respect, its position is between the fully conscious choice behavior in risk taking and the totally unconscious choice behavior in binocular rivalry. Individuals with high ambivalence are those who tend to vacillate between positive and negative evaluations and/or to employ strong defensive measures in order to inhibit or suppress one of the opposing attitudes. Individuals with high ambivalence and high conflict in general may demonstrate in decision making of various situations either a tendency to vacillate or a tendency toward defensive, single minded, stability. The factors which will determine the preference of one or the other types of behavior are the general anxiety level of the behaving individual, the degree to which the choice situation is anxiety provoking and the level of consciousness of this situation. Individuals with a high level of anxiety will tend to employ inhibition mechanisms more frequently in unconscious conflict situations, but may vacillate between alternative choices if the total situation or parts of it are conscious and not laden with high anxiety.

This theoretical discussion enables us to reconcile an apparent contradiction in the literature in the area of response variability, and it also enables us to explain the differences between the sexes which were found in the present study. We have mentioned earlier the Fiske-Rice review and Worell's study of response variability which show that disturbed persons and individuals with high internal conflict in general tend to demonstrate greater variability (3, 14). This agrees with our findings in both stages of the project which suggest the existence of a general tendency to vacillation. Individuals with high ambivalence demonstrated a tendency to vacillate in risk taking tests and in the Cat-Dog Test. The males in the present study also revealed the same tendency toward vacillation in the binocular rivalry test.

However, a series of studies of binocular rivalry consistently indicated that disturbed individuals tend to show a lower rate of alternation than well-adjusted individuals (5). Our female sample yielded additional evidence supporting this finding. Although ambivalent females tended to vacillate to a somewhat greater extent in the Cat-Dog Test, they showed less response variability than non-ambivalent females in the binocular rivalry test.

The difference between the binocular rivalry test and the Cat-Dog Test is that the decision making processes involved in the latter are conscious and the contents of decision are neutral, whereas the decision processes in the former are entirely unconscious and related to internal conflict areas and to anxiety. For this reason, females in our study who vacillate in the ambivalence test and in the Cat-Dog Test tend to employ inhibition mechanisms in the binocular rivalry test. We labelled this type of behavior "compensation".

The males in the present study revealed a greater consistency in response variability. Ambivalent males tended also to alternate on the binocular rivalry test. This difference between the sexes should perhaps be explained, in part, by the differences in experimental setup and motivation of the subjects of the two samples. In the first part of this report the "sophistication" and the defensive attitude of the female sample was described. The subjects in this sample were probably aware of the fact that the binocular rivalry test is meant to assess personality, and they approached the test with a greater degree of defensiveness. The dark room setting with the complicated apparatus also contributed to the threatening atmosphere of the situation. The male sample, on the other hand, was composed of soldiers, who perceived the test as an examination of skills and were highly motivated to do well on it, because they believed the tests were meant to select candidates for desirable jobs. Both the apparatus and the procedures of test administration were also much simpler than those employed with the female sample.

However, the findings seem to reflect real sex differences. For instance, frequent perception of the masculine and aggressive items rather than the feminine and affectionate items is related to a greater tendency to alternate for the males but with a lesser tendency to alternate for females. Obviously, individuals who tend to perceive items representing the opposite sex more frequently than items representing their own sex, reveal a strong conflict of sexual identity, and should therefore demonstrate a greater tendency to employ defensive inhibitions. Females with great sensitivity to stimuli with content of aggression certainly reveal a greater degree of conflict than males with a similar tendency. Activity, at least in our culture, is perceived as a trait more appropriate for males than for females. This explains the positive correlation between ambivalence and perceptual sensitivity to activity items in females and the negative correlation in males.

Thus, it is possible that the differential relationship between ambivalence and binocular alternations found in the present study for the male and female samples reflects a real sex difference. Ambivalent females may be more anxious and more likely to employ defense mechanisms, such as repression, than ambivalent males.

F. Summary

Twenty-nine female college students and 18 males, soldiers, were given a binocular rivalry test consisting of verbal and pictorial pairs of stimuli of incompatible content representing basic conflict areas. The female sample was also given the Frenkel-Brunswick Cat-Dog Test. Four perceptual styles were derived from the binocular rivalry test, namely, alternations, simultaneity, dominance and distortion. The same test also yielded scores of perceptual sensitivity for the five content categories, masculinity, aggressiveness, punitive socialization, activity and loneliness. Scores were derived from the Cat-Dog Test for perceptual rigidity, intolerance of ambiguity and vacillations.

The positive relationships between rigidity and ambivalence which was hypothesized on the basis of previous studies was not replicated in the present study nor was the relationship between ambivalence and intolerance of ambiguity. On the other hand, the relationship found in the first stage of the project between ambivalence and vacillations on the Cat-Dog Test was again demonstrated with the female sample. This sample showed also a positive relationship between vacillations and the perceptual styles of repression and distorted fusion in the binocular test and a negative relationship between the former and alternations in binocular resolutions. Subjects with high vacillations on the Cat-Dog Test tended to make a premature change of set in the same test. Subjects with high response latencies tended to report binocular resolutions of simultaneous perception of both stimuli in a pair rather than alternations or the dominance of a single stimulus.

Male and female subjects were similar in showing a certain degree of generality for perceptual styles on the binocular test, especially for alternations and yielded a negative correlation between the style of perceptual simultaneity and ambivalence. All the remaining relationships, of the binocular rivalry test were different for each sex. Males showed a positive correlation between alternation and the tendency to perceive masculine and aggressive items more dominantly, while a negative correlation was found between alternation and the tendency to perceive activity (rather than passivity) items more dominantly. For females these relationships were reversed.

Ambivalence for males was correlated positively with alternations and with sensitivity to masculine items, but negatively with the style of "repression" and with the tendency to perceive more items of activity. The females yielded reversed correlations for these relationships.

The relationships between vacillations in the three tests, ambivalence, the Cat-Dog Test, and the binocular rivalry test were discussed in the context of response variability. A distinction was made there between conscious and unconscious conflict and decision making, to reconcile contradicting findings in the literature and in the present study regarding response variability.

IV. THE IMPACT OF INDUCED EMOTIONS ON AMBIVALENCE AND HOSTILITY

A. Outline of Problem

According to psychoanalytic theory, ambivalent attitudes toward authority and sibling figures during childhood lead to an anxiety-provoking conflict and call for defense mechanisms from the moment that the child begins to feel fear and guilt about hostility, and feelings of discomfort about being inconsistent (8, 9). It follows from this hypothesis that an increase in guilt feelings in social interaction will be accompanied by a temporary decrease in ambivalent conflict toward others, with a concomittant increase in ambivalence toward self. This will result from an increment in hostility toward the self and a reduction in hostility toward others. We tested this hypothesis by means of a before-after design.

B. Method and Procedures

A sample of 29 males, college students, 19 to 24 years old, were given the ambivalence test, first under normal conditions and again after induction of guilt feelings. The first version of the test (which contained only 6 out of 10 figures: Commander, Social Worker, Father, Female Teacher, Brother and Self), was given to each S individually in one session. After the administration of the ambivalence test the subject was given the Taylor MAS and the Marlow-Crowne Social Desirability Scale. In the second session, removed by approximately one week from the first session, the subject was asked to solve a series

of problems by moving two handles of an apparatus which looked very expensive and complex. Each handle could be moved in 4 directions. A correct movement of a handle put out one of the lights of the apparatus, whereas a wrong movement caused an electric bell to ring loudly. The solution of a problem required a number of simultaneous movements of both handles. When the subject announced his readiness to begin the problem, a metronome was activated at the rate of a beat per second. The subject was required to move the handles every four seconds. The subject was told that the apparatus was expensive and delicate and was politely but emphatically asked to move the handles cautiously, because strong pressure might cause some damage. No subject could follow these instructions carefully, because he was later urged by the experimenter to work fast and his attention was concentrated on the metronome and on the outcomes of his attempted solutions rather than on the degree of strength of his movements. The apparatus was rigged in such a manner that after the presentation of 4 problems, the first movement of the handles caused a short-circuit followed by a loud explosion and sparks. The apparatus could not be reactivated by the regular switch. Both experimenters "examined" the apparatus and simulated distress. One openly accused the subject of being negligent in handling the apparatus and stated with dismay that repairs might take a long time and be very expensive. The second experimenter, who administered the first version of the ambivalence test to the subject, nodded his head and said politely but sorrowfully to the subject: "Well, no matter, let us go on with the remaining tasks." The "accuser" left under the pretext of going to ask the advice of a technician, and the second experimenter started with the administration of the second version of the ambivalence test. This version contained the evaluation of three figures, who appeared in the first version of the test, Father

Social Worker and Self, and three additional figures, Mother, Sister and Male Teacher. After the completion of the adjectives and their rating for the 6 figures, the "accusing" experimenter entered the room and, ignoring the subject, informed the second experimenter that the technician suspected that it would be necessary to order some parts from abroad, but that he would come the next day to inspect the apparatus. The second experimenter showed great concern and sent the "accuser" to ask the technician to come for an inspection as soon as possible. All this was done in order to reintegrate in the subjects the feelings of discomfort before beginning to evaluate the figures on the semantic differential. After the completion of the semantic differential part of the ambivalence test, the subject was told the truth about the procedure. In the "therapeutic" conversation he was asked about his feelings during the procedure and was instructed to describe his feelings in an open-ended questionnaire and to rate them on a semantic differential consisting of 7-point scales for fear, guilt and resentment.

C. Variables and Scoring

1. Ambivalence and hostility.

An average score of ambivalence and hostility for the 6 figures before and after the induction of guilt, as well as two scores of ambivalence and two scores of hostility for Father, Self and Social Worker, who were rated twice, before and after our manipulation, were computed to compare the influence of our experimental induction of guilt.

2. Reported nature of feelings.

The observations during the experiment and the conversations at the end left no doubt that all subjects believed in the sincerity of the reactions of the experimenters. But their written answers to the

open end questions and to the semantic differential revealed various degrees and kinds of feelings on their part. We obtained from the semantic differential scores for the extent of a subject's feelings of guilt, fear or resentment against the experimenters. The answers to the open end questions were classified and scored by three judges for feelings of guilt, discomfort and anger.

3. Moderating variables.

Our hypothesis about the reduction in ambivalence and hostility as a result of induced guilt was based on the psychoanalytic notion that guilt is closely related to anxiety and leads to defensive measures of undoing, reparations and atonement (9). The nature of the relationship between guilt and anxiety has never been clarified in psychoanalytic literature. It seems to us that guilt consists of cognitive and emotional components. The cognitive components contain moral judgements concerning behavior, the emotional components contain a variety of feelings ranging from slight discomfort to morbid anxiety and self hatred. The nature and intensity of the emotion which will accompany moral judgements about transgression and the type of behavior which will follow, are a function of the individuals predispositions for anxiety and defensiveness. If this is true, then our hypothesis about the impact of induced guilt on ambivalence and hostility should be reformulated with certain qualifications: Induced guilt will mostly effect the ambivalent and hostile attitudes of individuals who are anxiety prone and demonstrate defensive tendencies. These qualifications implied the use of anxiety and defensiveness as moderating variables. Scores of anxiety were derived from the Taylor MAS and scores of defensiveness from the Marlow-Crowne SDS.

D. Results

The average ambivalence score for the 6 figures as well as the separate scores for Father and Social Worker show a significant decrease after the experimental manipulation which supports the first part of our hypothesis. However, we also predicted that ambivalence toward Self would show an increase after the experimental manipulation, but we obtained a decrease, although not a significant one. The results are given in the following table:

Table 30: A Comparison Between Ambivalence Scores Before and After Induction of Guilt

	<u>before</u>	<u>after</u>	<u>"t"</u>	<u>significance</u>
1. Average ambivalence for 6 figures	13.99	9.63	6.38	$P < .001$
2. Ambivalence toward Father	11.29	8.48	2.30	$P < .05$
3. Ambivalence toward Social worker	18.09	8.59	7.28	$P < .001$
4. Ambivalence toward Self	13.55	11.11	1.25	NS

We reasoned that the decrement in ambivalence toward others after induction of guilt would be caused by a decrement in hostility and the increase in ambivalence toward self by a corresponding increase in hostility. This hypothesis was not borne out. Subjects were on the average fairly consistent in their hostility in both parts of the test. We then examined whether degrees of guilt feelings, defensiveness, and anxiety or a combination of these variables had an influence on hostility in both parts of the test. A statistical examination failed to show such an influence. However, when we divided our subjects into those who felt guilt and those who felt anger or were indifferent on the basis of the open end questions and eliminated those who reported mixed feelings, we obtained a nearly significant difference in the decrease of hostility between subjects with and without guilt feelings. This is shown in Table 31:

Table 31. The Impact of Guilt on the Decrease of Hostility

Feelings	Guilt	Hostility after manipulation	Hostility after manipulation
		<u>decrease</u>	<u>increase</u>
		10	3
	anger		
	or fear	2	5

The greater tendency of subjects who report guilt feelings to reduce their hostility, as compared with those who did not, is significant by the Fisher test only at the .07 level. The great majority of the "guilty" individuals demonstrated a reduction in hostility. Non "guilty" individuals indicated a somewhat stronger trend to be more hostile after our manipulation and those with mixed feelings were evenly divided. For this reason, average hostility of the total sample maintained the same level before and after the experimental manipulation.

It should be noted, however, that the decrease in ambivalence after the experimental manipulation was characteristic not only of individuals who showed a corresponding reduction in hostility but also of those individuals who indicated an increment in hostility. An examination of the indices of the ambivalence score which were employed in the present study (long reaction time for adjectives, the proportion of positive and negative adjectives, the discrepancies between ratings of figures on equivalent scales of the semantic differential, and the tendency toward the origin point) before and after experimental manipulation, showed a decrease after our manipulation in all four indices. However, the greatest and most significant changes were obtained for the reaction time on the adjective test and for the discrepancies on the equivalent scales in the semantic differential. It is impossible to decide whether these changes are due to the experimental manipulation or to an adaptation to the ambivalence test. The answer to this question can be given only by the repetition of the total procedure with a control group omitting the induction of guilt.

E. Summary

Twenty-eight males were administered the ambivalence test twice, before and after a procedure of guilt induction. Average hostility remained at the same level but average ambivalence showed a significant decrease. When the individuals reporting mixed feelings after the experimental manipulation were eliminated from data analysis and only those with and without guilt feelings were compared, the "guilty" individuals showed a greater tendency to reduce their hostility after the experimental manipulation. The general reduction of ambivalence for the total sample was mainly caused by the reduction of reaction time and by a greater consistency of ratings in the test. A similar study with a control group will be needed for a more comprehensive interpretation of results.

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